AN INVESTIGATION OF MINDFULNESS AS A THERAPEUTIC TOOL FOR THE DISTRESS AND DISRUPTION ASSOCIATED WITH HEARING PERSISTENT VOICES.

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“I’m not as reactive as I used to be, even though it’s only been a short time, just a number of weeks… I can see real hope for the day when I will have greater acceptance and a greater ability to sit with my experiences, and still know that it’s all okay.”

- Anonymous Voice Hearer
Abstract

Up to 50% of individuals with psychosis experience persisting positive psychotic symptoms, such as auditory verbal hallucinations (or ‘voices’) and delusions, despite the use of antipsychotic medication. Treatment of these refractory symptoms has been a major target in the development of psychological therapies for psychosis. As psychological approaches have continued to develop, there has been increasing use of third-wave interventions that focus on mindfulness and acceptance. Previous findings from meta-analyses in this field have found small to moderate treatment effects for such third-wave approaches on psychotic symptoms. However, these meta-analytic examinations had limited exploration of between-group treatment effects, particularly in relation to positive symptoms and mindfulness-based interventions, and since the emergence of these previous meta-analyses, two large randomised controlled trials have been published. Although previous literature has outlined several theoretical benefits for the use of mindfulness for distressing voices and the preliminary evidence of cross-sectional findings is encouraging, more empirical research is needed to identify whether mindfulness helps individuals to adapt to the experience of hearing voices. Particularly, in relation to the negative voice impacts such as distress, disruption, and resistant responding that are commonly targeted by psychological interventions.

Moreover, despite several randomised controlled trials of mindfulness interventions for psychosis being reported by previous literature, only one trial has utilised a protocol for, and considered outcomes on, persistent voices. Encouraging findings from this intervention trial, and relevant case studies of symptom-specific mindfulness protocols, suggest further research is needed to determine the feasibility and potential efficacy of such approaches for distressing voices in a pragmatic one-to-one format that will aid therapeutic dissemination. Therefore, the overarching research goal for this thesis was to empirically test the use of mindfulness as a therapeutic tool for managing the distress and disruption associated with psychotic symptoms, specifically distressing voices. To achieve this goal, the thesis was divided into three empirical studies.
Study one aimed to determine the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis. Results indicated that third-wave interventions are efficacious for the treatment of psychotic symptoms, and for the treatment of depressive symptoms in the context of psychosis. Significant between-group post-intervention differences on mindfulness are consistent with the suggestion that improved mindfulness is a potential mechanism of observed symptom change. Study two aimed to establish whether mindfulness can help people to adapt to the experience of hearing voices and to pinpoint specific targets for psychological interventions for persistent voices. Findings suggested that mindfulness of voices related to reduced severity of voice-related distress and less resistant responding to voices. However, these observed levels of negative voice impacts associated with mindfulness did not appear to be associated with voice-related functional impairment.

Lastly, study three aimed to develop an individual mindfulness-based protocol for distressing voices and determine the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers. Furthermore, it aimed to obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention. Results indicated the individual Mindfulness for Voices (iMPV) treatment protocol is acceptable, engaging and safe for individuals experiencing hearing voices. Small-to-moderate effects were revealed for pre-post improvements in the negative impact of voices, depressive symptoms and voice-related disruption. Large effects for changes in process measures of mindful responding and attentional switching accuracy suggest these to be potential mechanisms of change warranting further investigation. Overall thesis findings suggest further large-scale feasibility trials are warranted to ascertain the efficacy for focused mindfulness interventions for distressing voices. Such efforts should focus on aiding dissemination in clinical practice by using an individual delivery modality.
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humour and adventure along this at times challenging journey. I couldn’t have done this
without you.
Declaration

"I declare that this dissertation does not incorporate without acknowledgment any material previously submitted for a degree in any University, College of Advanced Education, or other educational institution, and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text. I further declare that the ethical principles and procedures specified in the Faculty of Health, Arts and Design Human Research Ethics Committee document have been adhered to in the preparation of this report."

Signed

Miss Stephanie Louise          Date 27.04.18
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<th>Full Form</th>
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<tr>
<td>MBI</td>
<td>Mindfulness-Based Intervention</td>
</tr>
<tr>
<td>iMPV</td>
<td>individual Mindfulness Program for Voices</td>
</tr>
<tr>
<td>ACT</td>
<td>Acceptance and Commitment Therapy</td>
</tr>
<tr>
<td>CBTp</td>
<td>Cognitive Behavioural Therapy for Psychosis</td>
</tr>
<tr>
<td>CFT</td>
<td>Compassion Focussed Therapy</td>
</tr>
<tr>
<td>PBCT</td>
<td>Person-Based Cognitive Therapy</td>
</tr>
<tr>
<td>MBCT</td>
<td>Mindfulness-Based Cognitive Therapy</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Control Trial</td>
</tr>
<tr>
<td>TAU</td>
<td>Treatment As Usual</td>
</tr>
<tr>
<td>PSYRATS</td>
<td>Psychotic Symptom Rating Scales</td>
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<td>PANSS</td>
<td>Positive and Negative Syndrome Scale</td>
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<tr>
<td>SMQ</td>
<td>Southampton Mindfulness Questionnaire</td>
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<tr>
<td>SMVQ</td>
<td>Southampton Mindfulness of Voices Questionnaire</td>
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<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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Note. This list is not exhaustive and contains only important or commonly used abbreviations mentioned within the text.
List of Peer Reviewed Publications during Candidature

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iii. $1,000 Swinburne Achievement Award. (2015).
CHAPTER 1: INTRODUCTION
CHAPTER 1: INTRODUCTION

1.1 Chapter Guide

The aim of this introductory chapter is to give the reader an understanding of the overarching goal of this thesis and to provide a brief overview of the thesis structure.

1.2 Thesis Goal

The overarching research goal of this thesis is to empirically test the use of mindfulness as a therapeutic tool for managing the distress and disruption associated with psychotic symptoms, specifically distressing voices. It is hoped this dissertation will provide a significant contribution to the scientific literature relating to the use of mindfulness with psychosis and specifically its utility in the treatment of persistent voices. Furthermore, it aims to fill identified gaps in this literature by providing a deeper understanding of the effects of mindfulness on the negative emotional and functional impacts associated hearing chronic, distressing voices. Finally, this thesis aims to contribute to clinical practice through the development of an individual-format, manualised, mindfulness-based intervention for persistent voices. This dissertation is presented as a set of three interrelated empirical studies, which together are designed to specifically address the overall thesis goal. The structure of this dissertation is thesis by associated papers, that includes three empirical papers that are either in press or under review within peer-reviewed academic journals. Given the employment of this thesis format and the inclusion of these papers as the main body of this thesis, it should be noted there is some unavoidable repetition, specifically in relation to the literature review and the introductory sections of the empirical papers in chapters 4, 5, and 6. Despite this repetition, each of these papers describes a study that is unique in its aims, method and design. Together, the findings from each of these studies function to address the four specific research aims presented in Chapter 2 and the overarching research goal of this thesis outlined above. Of note, UK English spelling is employed throughout this dissertation, in accordance with university requirements. A short preamble or guide has been provided at the beginning of each chapter, with an aim of orienting the reader and demonstrating how each empirical paper interrelates to form a cohesive body of research. In line with university guidelines, all of the research within the included empirical studies included in this dissertation was conducted within the set
period of candidature and in accordance with ethical requirements. Ethics approval certificates for studies 2 and 3 are presented in the thesis appendices (see Appendix A).

1.3 Overview of Thesis Structure

The following section details the overall structure of this thesis. This introductory chapter (Chapter 1) provides the overall thesis goal and some general information relating to the structure of the dissertation. A narrative review of the literature is presented in Chapter 2, which provides a background to the concepts and relevant academic research relating to the overarching thesis topic. The literature review chapter concludes with a brief rationale for the current investigation and an explanation of the specific thesis research aims. Given this dissertation has been formatted to include associated papers restrictions regarding manuscript length often preclude detailed methodological sections. Therefore, Chapter 3 provides additional methodological information for each of the three empirical studies that was not able to be included within the manuscripts. The chapter also presents information relating to the overall thesis design and how each of the studies inter-relate and work together to address the overall thesis goal and research aims. The three empirical papers are subsequently presented in Chapters 4, 5, and 6. Each of these manuscripts were prepared in accordance with the specific formatting requirements of the academic journals in which they were submitted for publication. Chapter 4 presents empirical study 1, in which a comprehensive and up-to-date meta-analysis of RCTs of third-wave interventions was conducted, with an aim of determining the efficacy of these approaches in psychosis. Study 2 is described in Chapter 5 of this dissertation and was designed to build systematically on study 1 by establishing whether from a theoretical perspective, mindfulness could help people with psychosis adapt to the experience of hearing voices. It aimed to identify whether mindful relating to voices predicted voice-related negative impacts such as distress, disruption and resistant responding, when the influence of voice topography and mood symptoms were controlled for. Study 3 is presented within Chapter 6 and was designed to build upon the findings from studies 1 and 2 by developing an individual, brief mindfulness intervention for persistent voices and assessing the acceptability and feasibility of this program. Study 3 also aimed to examine the potential effectiveness of this program to reduce the negative emotional
and functional impact of voices and to obtain further information on potential psychological and neurocognitive mechanisms of change. A general discussion is then presented in Chapter 7 of this thesis, which provides a summary and synthesis of the primary research findings and the main theoretical and applied implications of these findings for research and clinical practice.
CHAPTER 2: LITERATURE REVIEW
2.1 Chapter Guide

This chapter provides an introduction to the relevant literature underpinning the overall narrative of the current thesis. The chapter begins by presenting an overview of psychotic disorders including prevalence rates, individual and societal burdens and characteristic symptoms. Following this, a review of the relevant scientific literature is provided in regard to the positive symptoms of psychosis, and more specifically, the experience of hearing voices. The phenomenology of the experience, as well as negative impacts, and relevant explanatory models are discussed. Following this, a review of the current treatment options for the positive symptoms of psychosis is presented, including medication and psychological interventions. Particular focus is given to third-wave approaches, especially mindfulness-based interventions, as it is these approaches that are of major relevance to this dissertation. Lastly, a review of the theoretical rationale, as well as pertinent cross-sectional and intervention studies, which provide justification for why mindfulness may be helpful for distressing voices is presented. This literature review provides context for the larger research goal and specific research aims of the thesis and for the empirical studies presented in chapters 4, 5 and 6. This literature review includes only scientific, peer-reviewed publications to ensure the information provided is of sound quality. Given the wide range of concepts discussed in the current literature review, a narrative review format has been selected as the appropriate method for synthesising the extant research (Grant & Booth, 2009). The literature review chapter concludes with a brief rationale for the current investigation and an explanation of the specific thesis research aims.
2.2 An Overview of Psychotic Disorders

2.2.1 Prevalence rates

Psychotic disorders are a group of severe psychiatric illnesses comprising schizophrenia spectrum disorders, bipolar disorder and major depressive disorder with psychotic features. Lifetime prevalence estimates for all psychotic disorders are highly varied but have been proposed to be as high as 2.99%, with schizophrenia spectrum disorders being the most prevalent diagnosis (Perälä et al., 2007). Worldwide lifetime prevalence rates of schizophrenia have often been cited to be 1% of the general population (Saha, Chant, Welham, & McGrath, 2005). However, recent literature suggests this is perhaps an overestimate and has proposed this to be the result of methodological shortcomings and large heterogeneity between populations reported in such studies (Simeone, Ward, Rotella, Collins, & Windisch, 2015). For instance, a recent systematic review reported lifetime prevalence estimates to range between 0.06% and 5%, with a median of 0.48% (Simeone et al., 2015), with previous literature suggesting this figure to be closer to 0.4% (McGrath, Saha, Chant, & Welham, 2008). Past research has identified several factors to influence prevalence rates such as age, gender, urban and rural residence, migration status and global economic position (Kirkbride et al., 2006). For instance, Simone and colleagues (2015) identified large cross-cultural variation in lifetime prevalence estimates between world regions: Africa (0.06%), North America (0.15%), Asia (0.10%), Europe (0.21%), and Oceania (0.40%).

2.2.2 Individual and societal burdens

Psychotic disorders have been related to many individual and societal burdens including increased rates of homelessness, substance use, incarceration and suicide (Herrman et al., 2004; Kavanagh et al., 2004; Lamberti, 2007; Radomsky, Haas, Mann, & Sweeney, 1999). For instance, in a study of homelessness in Melbourne, Australia, Herrman and colleagues (2004) found that 34% of individuals living in marginal accommodation met diagnosis for a psychotic disorder, with lifetime prevalence figures reported to be as high as 49%. These individuals were mostly single, unemployed men reporting impairments in social functioning and self-care (Herrman et al., 2004). Comorbid substance use disorders are commonly reported in individuals with
psychosis, with prevalence rates being as high as 40% (Kavanagh et al., 2004). Substance misuse has been linked to a more severe illness course, impaired functioning, and increased inpatient admissions (Kavanagh et al., 2004).

Furthermore, an increased risk for criminal conviction and incarceration has been reported for individuals with a psychotic disorder (Lamberti, 2007; Wessely, Castle, Douglas, & Taylor, 1994). With some studies suggesting the incidence for psychotic symptoms amongst prisoners to be up to ten times higher than that of the general population (Brugha et al., 2005; Butler, Allnutt, Cain, Owens, & Muller, 2005). Additionally, a recent meta-analysis by Hjorthøj, Stürup, McGrath, and Nordentoft (2017) has suggested that psychotic disorders, such as schizophrenia, can decrease the lifespan of an individual by up to 14.5 years. Previous literature has proposed this high mortality risk to be largely due to increased suicide rates, with estimates of lifetime attempts and deaths as a result of suicide approximately 30% and 10%, respectively (Caldwell & Gottesman, 1990; Radomsky et al., 1999). Additional factors relating to this high mortality risk are increased physical health complications due to antipsychotic side effects such as weight gain and cardiovascular and metabolic abnormalities (De Hert, Detraux, Van Winkel, Yu, & Correll, 2012).

2.2.3 Symptoms

Historically the key features of psychotic disorders were broadly characterised by a two-factor model including positive and negative symptoms (Andreasen & Olsen, 1982). However, more recent literature has proposed three or even five-factor models that have also recognised cognitive, mood and functional symptoms of the illness (Blanchard & Cohen, 2006; Peralta & Cuesta, 1999; D. A. Smith, Mar, & Turoff, 1998). For instance, a range of cognitive impairments have been found to be associated with psychotic disorders, particularly in the areas of ‘executive functioning’, an umbrella term referring to a range of functions that include the capacity to plan, organise, attend to, monitor and inhibit behaviours, as well as in the areas of language and memory (Minzenberg & Carter, 2012). Such cognitive deficits are evident to some extent premorbidly, preceding the onset of the illness and are usually stable or enduring throughout the duration of the illness and often during symptom remission (Minzenberg
& Carter, 2012; Pfammatter, Brenner, Junghan, & Tschacher, 2011). Cognitive impairments hinder day-to-day functioning and are a strong predictor of clinical, social and functional outcomes (Minzenberg & Carter, 2012; Pfammatter et al., 2011).

2.2.3.1 Negative symptoms

Characteristic negative symptoms have been suggested to represent an absence in normal functioning, such as restricted expression or flat affect, restricted or poverty of speech or alogia and a lack of motivation and goal directed behaviour or avolition (American Psychiatric Association, 2013). Negative symptoms can be referred to as primary or secondary in nature (Peralta, Cuesta, Martinez-Larrea, & Serrano, 2000). Primary negative symptoms are those considered to be specifically related to the disorder, whilst secondary negative symptoms are thought to be related to other sources (e.g. depression or antipsychotic-induced extrapyramidal symptoms such as akinesia; Peralta et al., 2000). It is often difficult for clinicians to distinguish between these primary and secondary negative symptoms in psychosis; however, implications for treatment decision-making and prognosis make the differentiation between these symptom sources particularly important (Peralta et al., 2000). For instance, the severity of primary negative symptoms has been related to increased cognitive deficits and are a predictor of poorer psychosocial functioning and worse illness outcome (Milev, Ho, Arndt, & Andreasen, 2005). Despite these impacts and the wide range of available pharmacological and psychological treatment options for psychotic symptoms, no interventions to date have demonstrated reliably significant improvements in negative symptomatology (Buckley & Stahl, 2007).

2.2.3.2 Positive symptoms

Positive psychotic symptoms are those that represent phenomena occurring in addition to normal range functioning such as, delusions or thought distortions, disorganised thinking or formal thought disorder, hallucinations, and disorganised or catatonic behaviour (American Psychiatric Association, 2013). Delusions are classically considered ‘fixed beliefs’ that are maintained despite the contradiction of reality or conflicting evidence (American Psychiatric Association, 2013). The content of these
beliefs can encompass a range of themes including persecutory, grandiose, referential, somatic and religious (American Psychiatric Association, 2013).

Formal thought disorder is usually deduced from an individual’s speech and includes communication impairments such as derailment or loose associations, tangentiality, and incoherence (American Psychiatric Association, 2013). These communication problems seen in psychotic disorders have also been linked to neurocognitive deficits, such as impaired executive functioning and semantic processing (Kerns & Berenbaum, 2002). Disorganised or abnormal behaviour, including catatonic behaviour, is a key feature of psychotic disorders characterised by changes in motor functioning including physical agitation, rigid or inappropriate posture, or a lack of verbal responses and motor movements (American Psychiatric Association, 2013). These problems often result in difficulties in goal-directed behaviour and subsequent impairments in daily functioning (American Psychiatric Association, 2013).

2.2.3.3 Hallucinations

Perceptual experiences occurring without corresponding external stimuli are a hallmark symptom of psychosis. These experiences can occur in any sensory modality such as the auditory, visual, tactile, or olfactory and gustatory systems (Mueser, Bellack, & Brady, 1990). Auditory verbal hallucinations or ‘voices’ are the most prevalent perceptual disturbance and have been found to occur in up to 80% of individuals with a schizophrenia spectrum disorder (Andreasen & Flaum, 1991; Mueser et al., 1990). The experience of visual, tactile and olfactory and gustatory hallucinations has been found to be far less common, with prevalence rates of 16%, 17% and 11%, respectively (Mueser et al., 1990).

2.2.3.4 Voices

The experience of hearing voices has been defined as the perception of verbal or ‘speech like’ auditory content, without the presence of external stimuli (American Psychiatric Association, 2013). An analysis of the phenomenology of voice hearing suggested five essential characteristics of the experience: 1) the experience has a ‘compelling sense of reality’, 2) the voices have their own identity, 3) the content of
what the voices say is personally meaningful to the hearer, 4) the individual has a relationship with the voices, and 5) the experience has an emotional impact on the person and their life (Beavan, 2011). Although most commonly seen in schizophrenia spectrum disorders, the experience of hearing voices has also been found to be prevalent in bipolar disorder and major depressive disorder with psychotic features, albeit in lower rates (Toh, Thomas, & Rossell, 2015). Voices have also been reported in a range of populations further to psychotic disorders such as borderline personality disorder, post-traumatic stress disorder and non-clinical groups (Larøi et al., 2012). For instance, up to 80% of individuals grieving a loved one experience hallucinations (Grimby, 1993). Previous literature has identified characteristics of the voice-hearing experience that can distinguish between those associated with psychosis and those experienced by the general population (Baumeister, Sedgwick, Howes, & Peters, 2017). For instance, voices heard by non-clinical groups are likely to occur infrequently, be of short duration and of either neutral or pleasant content (Baumeister et al., 2017). Additionally, these experiences are usually associated with less or no distress and increased perceived control compared with that experienced by individuals with psychosis (Baumeister et al., 2017).

One’s culture can greatly impact how hallucinations are identified, with considerable variation in the experience of hearing voices being noted across cultures (Larøi et al., 2014). For instance, differences in the form, content, subjective meaning and prognosis of the experience has been identified by previous literature (Lambrecht & Taitimu, 2012; Luhrmann, Padmavati, Tharoor, & Osei, 2015). Hallucinatory content experienced by Christians for example is more likely to be about religious figures such as god, Christ, Mary and Satan (Larøi et al., 2014). The experience of hearing voices has often been considered a spiritual experience around the world and played a role in various cultural traditions and rituals (Larøi et al., 2014). Past research has suggested more positive outcomes for non-Western cultural contexts in which spiritual constructions for voice-hearing is common (e.g. South African shamans or sangomas; Lambrecht & Taitimu, 2012; Lin & Kleinman, 1988). However, it is important to note that ‘outcomes’ are also defined by cultural context. For instance, individuals from Western cultures in which there is a large emphasis placed on career and work
schedules, may be perceived as more functionally impaired than those who are able to maintain active roles within their local community (Larøi et al., 2014).

It is important to mention that the following sections on voices and the overall dissertation will focus primarily on the experience of hearing voices within the context of Western clinical and cultural context. To that end, terminology used in these sections will reflect this focus on clinical voice-hearing, associated with psychosis, rather than the hallucinatory experience of the general population or alternate cultural contexts.

2.2.3.4.1 Phenomenology

The form or topography of voices can be highly variable during illness course and between individuals: for example, the number of voices heard, how often (frequency) and for how long (duration) they are heard, the intensity or volume at which they are heard (loudness) and where the voices sound like they are coming from (location; McCarthy-Jones et al., 2014; Nayani & David, 1996). For instance, in the largest phenomenology study of voices by McCarthy-Jones and colleagues (2014), over 50% of individuals said the number of voices they heard during their last experienced episode varied, and the duration and loudness at which they heard the voices also fluctuated throughout the day.

Similarly, the content of voices varies within and between individuals: although negative content is more commonly reported by voice-hearers, McCarthy-Jones and colleagues (2014) found that up to 40% of participants experienced hearing positive voice content. However, hearing critical and abusive content has been identified as especially common (Nayani & David, 1996). Additionally, although it has been reported that individuals often believe the voice content they hear to be similar to, or reflect thoughts they may have had, most voice-hearers are certain these voices are clearly distinguishable from their own thoughts (McCarthy-Jones et al., 2014). The form in which voices address individuals can range between specific commands in which individuals are told what to do and how to behave, to a running commentary of the individual’s actions, or to conversations between the different voices without reference to the individual at all (McCarthy-Jones et al., 2014). The identity of voices heard can also differ, with many individuals who experience hearing voices reporting
the identity of the voices to be of someone they have met or spoken to in the past, or of an influential person in their life, but others not recognised as known persons (McCarthy-Jones et al., 2014), Nayani & David, 1996).

### 2.2.3.4.2 Beliefs and habitual reactions

The explanations people give for their voices often involve that they are being communicated with by specific persons or humanlike entities, who are often ascribed intentions and other personal qualities (Chadwick & Birchwood, 1994). These appraisals are thought to be influenced by beliefs or schemas individuals have about themselves and others (Birchwood et al., 2004; Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000; Thomas, Farhall, & Shawyer, 2015). Furthermore, people report responding to their voices in ways similar to in social relationships (Benjamin, 1989; Hayward, 2003; Thomas, McLeod, & Brewin, 2009), including engaging in internal dialogue with them (Leudar, Thomas, McNally, & Glinski, 1997). The individual’s relationship with their voices seems to reflect broader social relationships and patterns of relating (Hayward, 2003).

The beliefs about intent and metacognitive beliefs individuals hold about the experience of hearing voices seem to be relatively stable over time and have been found to predict both voice-related distress and how they respond to the experience (Csipke & Kinderman, 2006; Pérez-Álvarez, García-Montes, Perona-Garcelán, & Vallina-Fernández, 2008). For instance, whether an individual’s appraisals for the voices in regard to malevolent or benevolent intent, and how much power or status they have over the voice-hearer, have been shown to predict behavioural responses to them, such as compliance with commands, or struggle and resistance (Birchwood & Chadwick, 1997; Chadwick & Birchwood, 1994; Chadwick, Lees, & Birchwood, 2000).

Metacognitive beliefs individuals hold about the voice hearing experience have also been demonstrated to predict the value placed on it and associated engagement levels (Morrison, Wells, & Nothard, 2002; Thomas et al., 2015). For instance, if an individual perceives the value of the voices to be positive, levels of engagement with, and attempts to maintain, the experience may be higher (Morrison et al., 2002). Conversely, negative self-beliefs associated with the experience (e.g., “I must be
crazy”) have been associated with greater levels of voice-related distress and emotional and behavioural resistance (Morrison, 1998; Morrison et al., 2002). It has been purported that attempts to resist and control voices, responses that are often habitually employed by voice-hearers, may result in increased attention towards the experience, in turn increasing preoccupation and intensity and associated distress (Farhall, Greenwood, & Jackson, 2007; Romme & Escher, 1989; Thomas, 2015a). Additionally, the use of distraction as a coping strategy for psychotic experience has been found to be associated with depression, anxiety and increased use of psychiatric services (Romme & Escher, 1989).

### 2.2.3.4.3 Voice-related distress and mood symptoms

As mentioned above, many people experience hearing positive voices that are associated with less or no distress (Honig et al., 1998). For instance, differences have been identified in the intensity of distress experienced by clinical and non-clinical voice hearers, with clinical voice-hearers experiencing significantly greater levels (Sorrell, Hayward, & Meddings, 2010). In clinical populations hearing voices is often, but not always, associated with experienced distress (McCarthy-Jones, 2012). It is important to note that this thesis will focus on the experience of voice-hearing in clinical populations (i.e. psychotic disorders), in which the experience is associated with negative impacts on experienced distress and or functioning.

According to cognitive and behavioural models, high levels of experienced voice specific distress is often related to other psychological factors rather than the mere presence of, or amount of voices experienced (frequency and duration; Chadwick & Birchwood, 1994; Morrison et al., 2002; Varese et al., 2016). As mentioned above, both negative beliefs regarding intent and metacognitive beliefs about the voice-hearing experience have been related to voice-related distress (Chadwick & Birchwood, 1994; Hill, Varese, Jackson, & Linden, 2012; Morrison et al., 2002). Similarly, specific appraisals and ineffective responses to voices such as resistance or avoidance have been linked to greater levels of voice-related distress (Varese et al., 2016). Likewise, the previous literature has identified that how an individual relates to their voices impacts on the associated levels of experienced distress (Sorrell, Hayward, & Meddings, 2010).
Specifically, the perception of the voice as intrusive and dominating has been associated with greater voice-related distress in individuals with psychosis, compared with non-clinical voice-hearers (Sorrell et al., 2010).

Overall distress in the form of comorbid mood symptoms such as depression and anxiety are commonly seen in individuals with psychosis (Pokos & Castle, 2006; Siris, Bench, Hirsch, & Weinberger, 2003). A link between hallucination severity and depression and anxiety has been identified: Lysaker and Salyers (2007) found that greater levels of overall anxiety were associated with increased hallucination severity, as evidenced by the Positive and Negative Syndrome Scale (PANSS). Furthermore, when the authors examined the anxiety subscales, severity of hallucinations was related to increased symptoms of physiological panic, social phobia, fear and irritability and distress (Lysaker & Salyers, 2007). Similarly, in a study of individuals with non-affective psychosis, Smith and colleagues (2006) found that depressive symptoms were associated with hallucination severity on the PANSS. When examined in more detail, it was identified that greater depression scores were related to increased frequency and intensity of negative voice content, less controllable voices and higher levels of voice-related distress and disruption (B. Smith et al., 2006). Furthermore, previous literature suggests that in addition to voice-hearers being at greater risk for experiencing mood symptoms, severity of voices is also linked to the engagement of dysregulated behaviours such as emotional suppression (Badcock, Paulik, & Maybery, 2011).

2.2.3.4 Quality of life and functioning

Early literature examining quality of life (QOL) in psychosis previously established the negative symptoms of psychosis to be more strongly associated with impaired QOL than positive symptoms (Browne et al., 1996; Galletly, Clark, McFarlane, & Weber, 1997). However, it has more recently been suggested the Quality of Life Scale (Heinrichs, Hanlon, & Carpenter, 1984), often used in psychosis, measures deficit symptoms that are closely aligned to and overlap with negative symptoms (Norman et al., 2000). Therefore, Norman and colleagues (2000) examined the relationship between psychotic symptoms, QOL and subjective psychological wellbeing. Positive symptoms were found to be more strongly related to subjective
wellbeing than QOL, which suggests hallucinations and delusions may have a larger impact on life satisfaction rather than functioning (Norman et al., 2000).

Similarly, research has suggested the negative symptoms suggested to impact functioning in voice-hearers specifically may be secondary symptoms to the experience of hearing voices itself (e.g. social withdrawal; Favrod, Grasset, Spreng, Grossenbacher, & Hode, 2004). For instance, it has been found that ineffective behavioural responses to voices such as engagement, are correlated with impaired social functioning, particularly when the individual considers the voices to be benevolent (Favrod et al., 2004). Together, these findings suggest the relationship between positive symptoms, specifically voices and QOL and functioning may be more complex than the conclusions originally derived by early literature.

### 2.2.3.4.5 Explanatory models for voices

As mentioned above, voice hearing is not only experienced in the context of mental illness (i.e. a psychotic disorder), but rather on a continuum with non-clinical individuals (Honig et al., 1998). Several explanatory models for the development of clinical voice-hearing, in the context of psychotic disorders, have been put forward within the literature. This section will focus on some of the most common psychological and cognitive explanatory models, as these are most relevant to the narrative of this thesis. However, it is important to note that a range of neurobiological, neurocognitive and psychodynamic models exist outside the presented literature (e.g. the dopamine hypothesis and attribution theory; Beck & Rector, 2005; Howes & Kapur, 2009).

#### Psychological explanatory models for voices

**Trauma and dissociation.** Previous literature has identified a history of traumatic experiences to be implicated in the development of positive psychotic symptoms such as voices (Varese, Smeets, et al., 2012). For instance, a large study of first admission patients diagnosed with a psychotic disorder found that up to 70% of participants had a lifetime exposure to a traumatic event (Neria, Bromet, Sievers, Lavelle, & Fochtmann, 2002). Furthermore, it has been suggested that individuals who experienced childhood sexual or physical abuse were more likely to experience positive symptoms (Ross,
More specifically, exposure to these types of traumatic events in childhood have been linked to command hallucinations and commenting voices (Read, Agar, Argyle, & Aderhold, 2003).

Past research also purports that post-traumatic stress disorder (PTSD) and psychosis may exist on a continuum of responses to traumatic experiences (Brand, Rossell, Bendall, & Thomas, 2017). Specifically, it has been suggested the cognitive processing of traumatic events may be linked to the later development of hallucinations or voices (Hardy et al., 2016; Steel, Fowler, & Holmes, 2005), and that symptoms traditionally considered to be experienced in PTSD such as flashbacks and intrusive thoughts can often appear in the form of hallucinations (Morrison, Frame, & Larkin, 2003; Romme & Escher, 1989).

The experience of dissociative states is one such post-traumatic response that has been linked to psychotic symptoms (Longden, Madill, & Waterman, 2012; Varese, Barkus, & Bentall, 2012) and has been suggested to be a mechanism underlying the experience of hearing voices (Moskowitz & Corstens, 2008). It has been proposed that an inability to reality test due to detachment from internal and external experiences may leave individuals more susceptible to these positive psychotic symptoms (Allen, Coyne, & Console, 1997). Additionally, previous research has suggested that dissociation, and more specifically depersonalisation, is strongly associated with hallucinations, and may in fact be a mediating factor in the relationship between childhood trauma and the experience of hearing voices (Perona-Garcelán et al., 2008; Perona-Garcelán et al., 2012). Perona-Garcelán and colleagues (2012) have proposed that dissociation may result in individuals attributing their own internal experiences such as thoughts to external sources.

*Inner speech.* One theoretical explanation for the development of auditory hallucinations that has been suggested by previous literature is that voices may simply be a variety of inner speech. Internalisation of external dialogue into inner speech is considered to be a developmentally normal mental process (Fernyhough, 2004). During this process, external dialogue undergoes both syntactic and semantic transformation and loses the acoustic and structural qualities of external speech’ (Fernyhough, 2004). It
has been proposed that under extremely stressful conditions, these transformations may be disturbed and inner speech may be re-externalised and experienced as auditory verbal hallucinations (Fernyhough, 2004).

**Cognitive explanatory models for voices**

*Source- and self-monitoring.* The misattribution of inner speech to external sources has been further explained by cognitive models of auditory verbal hallucinations, which suggests the experience of hearing voices may be the result of deficits in source- and self-monitoring processes (Waters et al., 2012). This theoretical framework proposes that individuals who experience hearing voices show impairments in discriminating between their own self-generated mental events such as inner speech and external stimuli due to neurocognitive difficulties engaging memory and executive processes during the retrieval of auditory memories (Waters et al., 2012). Although this link has been consistently identified by past research, impairments in source- and self-monitoring have also been found in psychosis patients without the experience of auditory verbal hallucinations, suggesting these deficits are not solely responsible for the development of voice hearing (Waters, Woodward, Allen, Aleman, & Sommer, 2010). Similarly, this model does not account for the experience of non-verbal or other forms of hallucinations such as noises or those occurring in the visual, tactile, or olfactory and gustatory systems (Waters, Badcock, Michie, & Maybery, 2006).

*Intentional inhibition and attentional control.* Deficits in executive functions that enable individuals to have control over their conscious states have been suggested by previous literature to play a role in the development of voice hearing (Waters et al., 2012). For instance, it has been proposed impairments in intentional inhibition explain the intrusive and uncontrollable characteristics of voice hearing (Waters et al., 2006). Specifically, a lowered ability in deliberately suppressing irrelevant cognitive events, which has been evidenced through a link between hallucination severity and performance on inhibitory conditions of the Hayling Sentence Completion Task and the Inhibition of Currently Irrelevant Memories Task (Waters et al., 2006). Patients experiencing hearing voices were also significantly more likely to demonstrate this inhibitory deficit compared with their non-hallucinating counterparts, suggesting this
may be a cognitive mechanism underpinning the experience of hearing voices (Waters et al., 2006). However, it has been suggested that an impairment in intentional inhibition may not be solely responsible for the development of auditory hallucinations, as many individuals with schizophrenia exhibit this deficit (albeit in lower numbers) without experiencing hearing voices (Waters et al., 2006). Previous literature has suggested the cognitive impact on the development of voice-hearing to be more complex in nature and that perhaps this deficit in intentional inhibition paired with difficulties in source- and self-monitoring are more likely to result in the experience (Waters et al., 2006). This is a somewhat novel theory proposed by current research, as prior to this, it had been thought that perhaps only one cognitive deficit was responsible for the development of hearing voices, whereas this model proposes the exploration of combinations of cognitive impairments. Additionally, current research is now trying to establish whether deficits exist in the context of memory, further than merely the source (e.g. the temporal context and combined source and temporal context of memories; Waters, Maybery, Badcock, & Michie, 2004).

Similarly, past research has proposed that individuals who experience hearing voices demonstrate impaired ability to control or switch their attention, which may be due to an increased amount of attentional resources on the voice hearing experience (Hugdahl, 2009; Waters et al., 2012). Such lowered ability in attentional switching or set-shifting have been further evidenced by a recent study by Siddi and colleagues (2017), which found that compared to patients without auditory hallucinations and healthy controls, voice-hearers demonstrated significantly poorer performance on the Trail Making Test - Part B. Despite empirical support for these theoretical models, it is important to note these theories are based on findings from schizophrenia samples and have not been established with individuals with other psychotic disorders such as bipolar, major depressive disorder, or borderline personality disorder. Additionally, these models do not necessarily account for the experience of hearing voices in healthy controls.
2.2.4 Treatments for positive psychotic symptoms

A range of treatments for the positive symptoms of psychosis have been reported by previous literature. This section will primarily focus on medications and psychological interventions described by past research; however, it is important to note a range of alternate and investigative treatment options exist in extant literature (e.g. Cognitive Remediation Therapy, Social Skills Therapy, eTherapy, Transcranial Magnetic Stimulation and Electroconvulsive Therapy) that will not be discussed in this section, as they are not relevant to the narrative of the dissertation.

2.2.4.1 Medications

Atypical or second-generation antipsychotics are the primary treatment method for psychosis (Rummel-Kluge et al., 2010). Medication nonadherence and underuse is a common problem in psychosis populations, with average rates being reported to be as high as approximately 50% (Dolder, Lacro, Leckband, & Jeste, 2003; Lacro, Dunn, Dolder, Leckband, & Jeste, 2002). In comparison with first-generation antipsychotics, atypical or second-generation antipsychotics are thought to have a lower incidence of extrapyramidal side effects, such as tardive dyskinesia, a disorder characterised by involuntary facial and body movements (Rummel-Kluge et al., 2010). However, side effects such as sedation, weight gain, glucose dysregulation (diabetes) and sexual dysfunction, which are commonly noted with the use of atypical antipsychotics, have been linked with reduced quality of life and medication non-adherence (DiBonaventura, Gabriel, Dupclay, Gupta, & Kim, 2012; Sullivan & Lukoff, 1990). It has been found that cognitive impairments commonly seen in schizophrenia do not respond well to current antipsychotic medications and only approximately one third of patients have favourable long-term outcomes from antipsychotics, even when medication treatment plans are adhered to (Minzenberg & Carter, 2012). Similarly, it has been suggested that up to 50% of individuals continue to experience positive symptoms such as voices despite the use of antipsychotic medications (Elkis, 2007). Treatment of these refractory positive symptoms has been a major target in the development of psychological therapies for psychosis (Burns, Erickson, & Brenner, 2014).
2.2.4.2 Psychological interventions

2.2.4.2.1 Psychoeducation

Psychoeducation programs informing patients and relatives about psychosis and its management are frequently offered throughout the course of the illness (Lincoln, Wilhelm, & Nestoriuc, 2007). A previous meta-analytic review by Lincoln and colleagues (2007) found that patient and family psychoeducation resulted in small to moderate reductions in relapse and rehospitalisation; however, these results were not maintained at 12-month follow-up. Small effect sizes were also observed for a gain in knowledge about psychotic disorders at post-treatment, but could not be calculated at follow-up (Lincoln et al., 2007). Conversely, no significant changes were identified for symptom reduction, functioning or medication adherence (Lincoln et al., 2007). When interventions for families and patients were analysed separately, only family psychoeducation resulted in this reduction in relapse and rehospitalisation (Lincoln et al., 2007). These results are not favourable given previous literature has identified that most psychoeducation programs within clinical settings are solely patient-focussed and family collaboration is seldom offered (Rummel-Kluge, Pitschel-Walz, Bäuml, & Kissling, 2006; Wynaden & Orb, 2005).

2.2.4.2.2 Peer support

Peer support groups for voice-hearers, often referred to as Hearing Voices Groups, are a core element of the Hearing Voices Movement’s focus on recovery, and have become increasingly common worldwide over the last 25 years (Corstens, Longden, McCarthy-Jones, Waddingham, & Thomas, 2014). Such groups are usually led by peer workers who have personally experienced hearing voices and are designed to facilitate shared experience and provide a safe and supportive environment for voice-hearers (Ruddle, Mason, & Wykes, 2011). Core principles of the groups, such as expertise and content development being solely the responsibility of group members, an open format where members can join and leave at any time, and the long-term nature of intervention delivery, make formally researching the effectiveness of hearing voice groups difficult (Corstens et al., 2014). Despite these difficulties, impacts of peer support on group members have been examined in one quantitative study (Beavan, de
Jager, & dos Santos, 2017) and two qualitative studies (Dos Santos & Beavan, 2015; Oakland & Berry, 2015). These found that members report increased self-empowerment and self-esteem, reduced isolation, and increased acceptance of voices (Beavan et al., 2017; Dos Santos & Beavan, 2015; Oakland & Berry, 2015). Results suggesting increased acceptance of voices are particularly pertinent, as one of the key principles of the peer-led hearing voices movement is that it is often more adaptive to learn to live with voices through acceptance, rather than trying to suppress or eliminate them (Corstens et al., 2014).

2.2.4.2.3 Family intervention

Evidence for improvements following the family-directed psychoeducation programs mentioned above appear robust (Kurtz & Mueser, 2008). The benefits of other family interventions involving crisis management and problem solving in individual family or group-based format have also been evaluated (Goldstein, Rodnick, Evans, May, & Steinberg, 1978; Leavey et al., 2004; Zhang, Wang, Li, & Phillips, 1994). A recent meta-analysis by Bird and colleagues (2010) failed to demonstrate significant pooled effects for reductions in relapse or rehospitalisation following family intervention. These findings are consistent with a more recent RCT of a family intervention for psychosis (see Garety et al., 2008). Additionally, only one of the existing trials of family interventions examined effects on psychotic and mood symptoms, and failed to demonstrate post-treatment improvements, compared with treatment as usual (TAU; Garety et al., 2008). Although family interventions have been designed to specifically target relapse prevention, there has been some initial application with positive symptoms such as voices (e.g., Jenner, Nienhuis, Wiersma, & van de Willige, 2004; Maxwell, Farhall, & Matyas, 2012), which have demonstrated encouraging findings. However, a recent systematic review identified that implementation of family interventions for schizophrenia is poor, with several barriers to dissemination of these interventions being identified (e.g. a lack of rigorous research and low levels of staff training; Bucci, Berry, Barrowclough, & Haddock, 2016).
2.2.4.2.4 Behavioural and coping interventions

Early interventions for hearing voices were largely founded on behavioural methods (Thomas, Paulik, Louise, Farhall, & Hayward, 2014). Such interventions focused on behavioural modification and enhancing effective responses to voices through approaches such as functional analyses of environmental antecedents and consequences, and the use of behavioural strategies to enhance natural methods of coping. This early literature paved the way for the examination of contemporary cognitive approaches for psychosis and informed the development of such interventions as Cognitive Behaviour Therapy for Psychosis and third-wave interventions with a focus on acceptance and mindfulness (Thomas, Paulik, et al., 2014).

A full review of these behavioural interventions, their theoretical underpinnings and the implications for contemporary approaches can be seen in a chapter by Thomas, Paulik, Louise, Farhall, and Hayward (2014) entitled ‘What have we learnt from behavioural and coping interventions for voices’ featured in the book Psychological Approaches to Understanding and Treating Auditory Hallucinations: from Theory to Therapy.

2.2.4.2.4.1 Internet and mobile technology

A recently emerging area in the literature over the last decade is the development and evaluation of internet and mobile technology for the self-management of positive psychotic symptoms. Such interventions are thought to overcome barriers to dissemination and increase access to psychological approaches for psychosis. For instance, Gottlieb, Romeo, Penn, Mueser, and Chiko (2013) developed a self-directed, web-based cognitive behavioural therapy program (Coping with Voices) for managing the experience of hearing voices. Participants who completed the program demonstrated a reduction in the overall severity of voices and increased social functioning compared with usual care at post-treatment (Gottlieb et al., 2017). Similarly, an interactive text messaging intervention (Mobile Assessment and Treatment for Schizophrenia; MATS) targeting medication adherence, socialisation and auditory hallucinations has been piloted in a sample of individuals with schizophrenia spectrum disorders (Granholm, Ben-Zeev, Link, Bradshaw, & Holden, 2012). Results revealed a significant reduction
in the severity of experienced voices, increased social functioning and better medication adherence for individuals living independently (Granholm et al., 2012). However, it should be noted that lower functioning individuals with more negative symptoms and lower estimated IQ did not complete the intervention, suggesting additional face-to-face therapy may be necessary for this particular sub-sample of participants (Granholm et al., 2012). Additionally, the evaluation of a cognitive behavioural therapy informed protocol for early psychosis with the use of a smartphone app is currently underway (Actissist; Bucci et al., 2015). The randomised control trial will report on feasibility and acceptability of the program and outcomes relating to the severity and distress of psychotic symptoms (Bucci et al., 2015).

2.2.4.2.5 Cognitive Behaviour Therapy for Psychosis (CBTp)

Originally developed in the United Kingdom in the late 20th century for the treatment of refractory positive symptoms (Tarrier et al., 1993), Cognitive Behaviour Therapy for psychosis (CBTp) is the recommended psychological treatment for schizophrenia in clinical practice guidelines (e.g. NICE; National Institute for Clinical Excellence, 2014). Through the revision and reappraisal of psychotic symptoms such as delusions and voices and their meaning, contemporary CBTp aims to reduce emotional distress and ineffective behavioural reactions often associated with these symptoms (Birchwood & Trower, 2006). A recent meta-analytic review by Jauhar and colleagues (2014) found small effects for CBTp on overall, positive and negative psychotic symptoms with Hedges’ $g$ sizes of 0.33, 0.25 and 0.13, respectively. These findings were consistent with the previous meta-analysis of Wykes, Steel, Everitt, and Tarrier (2008), who also identified small-moderate effects of CBTp on functioning and mood, compared with TAU. When contrast with other psychological interventions for psychosis, hence controlling for non-specific effects, these effects on psychotic symptoms remained (Turner, van der Gaag, Karyotaki, & Cuijpers, 2014). Emerging literature has proposed that symptom specific interventions may be more effective than broadly focussed CBTp, with moderate post-treatment effects being identified on medication-resistant positive symptoms (Hedges' $g = 0.47$; Burns et al., 2014), and more specifically for the treatment of hallucinations (Hedges' $g = 0.44$; van der Gaag, Valmaggia, & Smit, 2014).
Despite these encouraging findings, recent literature has cautioned against overstated claims of the level of therapeutic effects of CBTp, particularly on relapse and rehospitalisation (McKenna & Kingdon, 2014; Wykes et al., 2008). Similarly, a large focus on psychotic symptom outcomes in CBTp trials has been criticised given the therapeutic targets of distress alleviation rather than symptom reduction (Birchwood & Trower, 2006; Thomas, 2015b). Additionally, recent literature has highlighted dissemination issues for CBTp in routine clinical practice (Thomas, 2015b). For instance, despite being the standard recommended psychological treatment for psychosis, it has been suggested a number of issues with service provision exist including: 1) a lack of mandatory training in CBTp for mental health professions, paired with the advanced therapeutic skills required for delivery, and 2) the provision of psychological therapies for psychosis in public mental health settings being an adjunct rather than an essential component of routine care (Farhall & Thomas, 2013). From the perspective of clinicians in public mental health services, an underlying negative view towards the efficacy for psychological therapies for psychosis, and in particular for distressing voices, may also be a barrier to the dissemination of CBTp (Hazell, Strauss, Cavanagh, & Hayward, 2017). It is therefore unsurprising there has been increasing interest in more focussed “third-wave” interventions for psychosis, that can be delivered as a standardised educational course and may be simpler to disseminate than approaches like CBTp, which is based on individualised formulation and includes a large repertoire of therapeutic methods (Thomas, 2015b).

2.2.4.2.6 Third-wave interventions

As psychological approaches for psychosis have continued to evolve, one key advancement has been the application of third-wave cognitive behavioural therapies, with a focus on acceptance and mindfulness (Thomas, Hayward, Peters, et al., 2014). These interventions. These approaches emphasise the significance of one’s relationship with, and responses to (context and function) psychotic experiences and symptoms, rather than their form, and thus do not attempt to change or eliminate such phenomena (Hayes, 2004). The common thread between third-wave interventions is their founding on principles such as mindful and non-judgemental awareness, self-compassionate acceptance and defusion and their utilisation of experiential strategies aimed at
increasing the effectiveness of traditional cognitive and behavioural techniques (Hayes, 
2004). This family of treatment approaches for psychosis include acceptance-based 
approaches (e.g., Acceptance and Commitment Therapy), compassion-based approaches 
(e.g., Compassion-Focused Therapy) and mindfulness-based interventions (MBIs; e.g., 
Mindfulness Based Cognitive Therapy, Mindfulness Based Stress Reduction, and 
Person Based Cognitive Therapy). Although these approaches utilise a broad range of 
clinical techniques, given the aforementioned shared aims of these therapies, their 
combined treatment effects on psychotic experiences have often been examined by 
previous literature (see Cramer, Lauche, Haller, Langhorst, & Dobos, 2016; Davis & 

For instance, in a meta-analysis by Khoury and colleagues (2013) a small-to-
moderate within-group post-treatment effect for third-wave interventions on positive 
symptoms was identified (Hedge's g = 0.32; n = 7). Recently, Cramer, Lauche, Haller, 
Langhorst, and Dobos (2016) reported a moderate between-group treatment effect of 
mindfulness- and acceptance-based therapies on positive symptoms (SMD = 0.57). 
However, it should be noted, this analysis only included one focused mindfulness 
intervention (Cramer et al., 2016). Since these previous meta-analyses, several trials of 
third-wave interventions for psychosis have been published including two large-scale 
randomised controlled trials (RCTs; Chadwick et al., 2016; Shawyer et al., 2016).

The following section will discuss the potential efficacy for third-wave 
treatments for psychosis from a theoretical perspective and will then summarise and 
interpret the findings from the relevant intervention studies within the literature. Given 
the number of studies now published in this field, this section will primarily focus on 
RCTs due to the higher level of methodological rigor demonstrated by this trial design.

**Acceptance and Commitment Therapy (ACT) for Psychosis**

Acceptance and Commitment Therapy (ACT) is a behavioural approach that 
incorporates elements of acceptance and mindfulness to: 1) promote defusion from 
consuming patterns of thinking, and 2) increase psychological flexibility through 
enhanced awareness, openness and acceptance for difficult experiences (Hayes, Luoma, 
Bond, Masuda, & Lillis, 2006). ACT is based on the premise that unhealthy habitual
behaviours are produced by attempts to avoid or suppress difficult thoughts, feelings and sensations leading to a paradoxical increase in such experiences (Hayes et al., 2006). Development of an alternate relationship with internal experiences is fostered through the identification and modification of habitual reactions to symptoms and encouraged engagement in healthy value directed behaviours (Hayes, 2004). Alongside this, values clarification helps individuals to identify key personal values and convert these into specific behavioural actions (Hayes, 2004).

ACT has been found to be effective for the treatment of a range of physical and mental health problems such as chronic pain, stress, depression and anxiety (Hayes et al., 2006). More recently, ACT has been applied to the treatment of psychosis across a number of RCTs (e.g., Bach & Hayes, 2002; Gaudiano & Herbert, 2006; Shawyer et al., 2016; White et al., 2011). From a theoretical perspective, ACT may be particularly helpful for people with psychosis. For instance, it has been suggested that reducing avoidance and suppression of internal psychotic experience will decrease the commonly experienced paradoxical rise in more persistent psychotic symptoms (Gaudiano & Busch, 2013). Additionally, the acceptance and mindfulness exercises used in ACT attempt to keep individuals in the present moment, whilst developing a non-judgemental awareness of psychotic experiences as transient mental events (Gaudiano & Busch, 2013).

Randomised controlled trials. Several RCTs have assessed the efficacy for the use of ACT for individuals with psychosis. For instance, Bach and Hayes (2002) conducted the first RCT in which they randomly assigned 80 inpatients, with affective and non-affective psychotic disorders, to either ACT plus TAU or TAU alone. Following four individual ACT sessions, using metaphors and exercises modified for people with psychosis, it was revealed that significantly less participants in the ACT group were rehospitalised over a four-month follow-up period compared with TAU (Bach & Hayes, 2002). In addition, ACT participants showed significantly higher reporting of positive symptoms, yet lower believability in symptoms than TAU, suggesting they were better able to defuse from their psychotic experiences (Bach & Hayes, 2002). However, it should be noted that symptom measures were of self-report format rather than clinician rated. Bach, Hayes, and Gallop (2012) further assessed 64
inpatients of this sample at a one year follow-up and found that with length of current and previous hospitalisations controlled, rehospitalisation rates remained significantly lower for ACT participants compared with TAU.

Similarly, to replicate and expand on these findings, Gaudiano and Herbert (2006) randomly allocated 40 inpatients, with affective and non-affective psychotic disorders, into ACT plus enhanced treatment as usual (ETAU) or ETAU alone groups. Following an average of three individual ACT sessions, it was found the ACT group showed significantly reduced hallucination-related distress and greater improvement for clinical symptom severity and social and emotional impairment, in comparison with ETAU (Gaudiano & Herbert, 2006). It was also revealed that believability decreased over time in the ACT group and was an independent predictor of change in hallucination-related distress (Gaudiano & Herbert, 2006). ACT participants were also found to be 1.62 times less likely to be rehospitalised at four months follow-up than ETAU; however, this difference did not reach significance (Gaudiano & Herbert, 2006).

In a follow-up study of 29 participants from this trial (Gaudiano & Herbert, 2006), Gaudiano, Herbert, and Hayes (2010) found believability to be a significant mediator for the treatment of hallucination-related distress. This finding highlights the importance of an individual’s relationship with psychotic experience. Comparably, Bach, Gaudiano, Hayes, and Herbert (2013) recently re-examined the data of all 120 participants from the two original ACT studies (see Bach & Hayes, 2002; Gaudiano & Herbert, 2006). They found a 44% decrease in rehospitalisation rates, and significantly longer time spent out of hospital for ACT participants, compared with TAU (Bach et al., 2013). Furthermore, believability significantly mediated time to rehospitalisation at four months follow-up (Bach et al., 2013).

White and colleagues (2011) conducted a 12-month feasibility trial in which 27 participants with affective and non-affective psychotic disorders were randomly allocated to either ACT plus TAU or TAU alone. Following 10 individual ACT sessions, encompassing acceptance and mindfulness exercises, nil attrition and high session attendance rates supported the acceptability and feasibility of this intervention in psychosis. In regard to outcome measures, ACT participants experienced significantly
less negative symptoms and crisis contacts during the trial, compared with TAU (White et al., 2011). In terms of process measures, ACT participants demonstrated a significantly greater increase in mindfulness skills compared with TAU, and it was also found that increased mindfulness was associated with reduced depression (White et al., 2011). However, differences in change scores for depressive symptoms were not significant between the two groups, and no differences were identified for changes in acceptance (more recently referred to as psychological flexibility). It is important to note that despite change scores being insignificant, a significantly greater proportion of ACT participants changed from meeting criteria for depression prior to the intervention to no longer meeting diagnostic criteria following the intervention (White et al., 2011). Participants were selected due to their experience of affective symptoms following remission of psychosis symptoms, therefore inferences cannot be made for individuals experiencing persistent positive symptoms.

Conversely, in a study looking at an acceptance-based therapy for command hallucinations Shawyer and colleagues (2012) randomly assigned 44 participants with psychotic disorders to three groups, 1) Treatment of Resistant Command Hallucinations (TORCH), 2) Befriending, or 3) waitlist (TAU). The TORCH intervention consisted of 15 individual treatment sessions incorporating personalised psychoeducation, mindfulness, and acceptance exercises and metaphors (Shawyer et al., 2012). Following treatment, TORCH participants demonstrated significant improvements in compliance to command hallucinations, psychotic symptoms, functioning and quality of life (Shawyer et al., 2012). In regard to process outcomes, significantly greater acceptance for hallucinations was also seen in TORCH participants (Shawyer et al., 2012). However, contrary to expectations, participants allocated to the befriending condition were also found to improve in a range of outcomes, and differences between the two intervention groups did not reach significance (Shawyer et al., 2012).

Similarly, to ascertain the efficacy for the use of ACT for medication resistant or persistent hallucinations, Shawyer and colleagues (2016) randomised 96 participants to 8 sessions of ACT, in individual-format and including adaptations for psychosis, or befriending. Following the intervention, the ACT group reported significantly greater satisfaction with the therapy they received and subjective benefit in regard to problem
and emotional improvement, in comparison with befriending. Additionally, although no significant differences were identified on outcome measures at post-therapy, analyses at six-month follow-up revealed a significant reduction in psychotic symptoms and amount of voice-related distress in the ACT participants, compared with befriending (Shawyer et al., 2016). Likewise, over 50% of the ACT group demonstrated clinically significant improvement in positive symptoms at follow-up, compared with just over 20% of the befriending participants. However, no significant between-group differences were found for any of the examined potential mechanisms of change (acceptance, voice acceptance and recovery style).

**Summary of findings from ACT trials.** From these findings, it is apparent the use of ACT for individuals with psychosis has been associated with fewer and shorter rehospitalisation rates than TAU, and these differences are maintained at follow-up (Bach et al., 2013; Bach & Hayes, 2002; Bach et al., 2012; Gaudiano & Herbert, 2006). These results were consistent with moderate post-treatment effects on rehospitalisation reported by a previous meta-analysis (Khoury, Lecomte, Gaudiano, et al., 2013). Potential benefits of ACT for reducing hallucination-related distress and improving clinical symptom severity have also been proposed by previous findings (Gaudiano & Herbert, 2006; Shawyer et al., 2016; White et al., 2011). However, the pattern of symptom improvement appears inconsistent across trials (e.g., positive and negative symptoms; Shawyer et al., 2016; White et al., 2011). Consequently, it should be noted that differences existed between trials in regard to symptom status, which may be one potential explanation for these observed inconsistencies. For instance, three trials included inpatients currently experiencing psychotic symptoms (hallucinations or delusions; Bach et al., 2013; Gaudiano & Herbert, 2006; Gaudiano et al., 2010) and three trials included individuals recruited from outpatient mental health services who may (Shawyer et al., 2012; Shawyer et al., 2016) or may not (White et al., 2011) have been experiencing current psychotic symptoms.

In terms of the identification of potential mechanisms of change, believability has been found to be a significant mediator for reductions in hallucination-related distress and rehospitalisation rates (Bach et al., 2013; Gaudiano et al., 2010). Although no significant between-group differences in acceptance-based measures were reported
(Shawyer et al., 2012; Shawyer et al., 2016), mindfulness has been suggested as a potential mechanism of change warranting further examination (White et al., 2011). These findings pose the question, are the mindfulness principles and exercises utilised in broad ACT protocols responsible for the observed beneficial outcomes?

**Compassion-Focused Therapy for Psychosis**

Compassion-based approaches such as Compassion Focused Therapy (CFT) are based on the premise that individuals exhibiting high levels of shame and self-criticism have difficulty treating themselves with kindness and self-compassion or generating feelings of safety in relationships (Gilbert, 2009). Given the high levels of self-criticism and shame associated with many mental health disorders, these interventions foreground cultivating compassion towards self and others (Gilbert, 2009). As a way of enhancing coping and promoting affect regulation, CFT aims to decrease the amount of self-blame and criticism individuals hold in relation to their experienced symptoms and experiences (Gilbert, 2009). Recent literature has demonstrated promise for the use of CFT with a range of symptoms and disorders including depression, anxiety, trauma, obsessive compulsive disorder and personality disorders (Leaviss & Uttley, 2015). Recently, CFT has been examined for its effectiveness and potential mechanisms of change with psychotic disorders (see Braehler et al., 2013). High levels of stigmatisation and shame has been associated with the symptoms and diagnosis of psychotic disorders (Birchwood et al., 2007). These factors have also been related to increased negative affect and social anxiety, and subsequent avoidance and isolation (Birchwood et al., 2007). Additionally, high rates of relapse seen in psychosis are found to be correlated with feelings of self-blame, guilt and shame (Gumley & Schwannauer, 2006). From a theoretical perspective, CFT may help individuals with psychosis to learn to mindfully observe and compassionately accept unusual psychotic experiences, modify responses to feelings of social stigmatization and increase levels of positive affect through self-compassionate soothing (Gumley, Braehler, Laithwaite, MacBeth, & Gilbert, 2010).

**Randomised Controlled Trial.** Only one RCT evaluating CFT for psychosis exists in the current literature: Braehler and colleagues (2013) assessed the feasibility, acceptability and effectiveness of group-format CFT in a sample of 40 individuals with
psychosis. The 16 session intervention consisted of exploring the impacts of psychosis on participant’s lives, the development of compassion skills such as mindfulness, appreciation, reframing and imagery to replace habitual reactions to difficult experiences, and compassionate reflection on the recovery process (Braehler et al., 2013). Low attrition rates, high attendance rates and minimal exacerbation of clinical symptoms demonstrated the acceptability and feasibility of this intervention for individuals with psychosis (Braehler et al., 2013). Additionally, compared with TAU alone, at post-treatment participants who engaged in CFT plus TAU demonstrated a significantly greater improvement in clinical symptoms and stronger relationships between increases in compassion and reductions in depressive symptoms and feelings of social marginalisation (Braehler et al., 2013). These findings suggest CFT is safe and feasible to use for individuals with psychosis and provide promise for clinical improvement. However, further large-scale RCTs using active comparisons and measuring treatment fidelity and blinding are required to determine the efficacy of CFT, when controlling for non-specific effects and bias. Additionally, given the broad nature of the techniques used in CFT, examination of additional mechanisms of change such as mindfulness would provide information regarding the specific techniques related to beneficial outcomes.

Mindfulness-Based Interventions for Psychosis

Mindfulness interventions such as Mindfulness Based Cognitive Therapy (MBCT), Mindfulness Based Stress Reduction (MBST) and Person Based Cognitive Therapy (PBCT) suggest distress results from how an individual makes sense of and responds to an experience or sensation, rather than by the event itself (Kabat-Zinn, 1994). It is proposed that by increasing awareness and purposely attending to the ‘present moment’, in an accepting and nonjudgmental manner, distress will be alleviated (Kabat-Zinn, 1994).

Previous research has supported the use of MBIs for a range of physical and mental health problems, including mood disorders, substance-use disorders, eating disorders, stress and chronic pain (Baer, 2003). However, early literature cautioned against the use of mindfulness meditation with psychosis for the fear of exacerbating
active symptoms (Deatherage, 1975; Yorston, 2001). Yet, these studies were based on single case data and were methodologically weak. More recently, a body of research has emerged for the use of mindfulness for psychosis that has yielded encouraging findings, with a meta-analysis by Khoury and colleagues (2013) identifying moderate post-treatment effects of group format MBIs on psychotic symptoms (Hedge’s $g = 0.55$), compared with control.

These interventions use meditation practices and experiential exercises that focus on maintaining a ‘decentered awareness’ in the presence of internal psychotic experience (Chadwick, Hughes, Russell, Russell, & Dagnan, 2009a). From a theoretical perspective, the cultivation of mindfulness through this process provides individuals with an alternative relationship with psychotic symptoms rather than becoming preoccupied by such experiences, or attempting to change their frequency (Abba, Chadwick, & Stevenson, 2008; Chadwick et al., 2009a). Additionally, the observation of psychotic symptoms with an open and curious awareness and in the absence of adverse or judgemental reactions, leaves individuals more capable of reclaiming power over such experiences (Abba et al., 2008). Literature suggests that acceptance of psychotic symptoms and the self, facilitates such reclaiming of power (Goodliffe, Hayward, Brown, Turton, & Dannahy, 2010). In turn, a focus on the individual rather than their symptoms is considered to be vital in reforming an individual’s identity outside of psychotic experience (Goodliffe et al., 2010).

*Randomised controlled trials.* The following section will review the existing literature relating to RCTs of mindfulness interventions for psychosis. It is worth noting that a meta-analysis of this previous literature is performed in empirical study 1 (Chapter 4) of this thesis, which results in some cross-over of the reviewed papers. However, the following section will review the existing trials and their findings in further detail than that outlined in the first empirical paper.

To date, there have been six RCTs conducted evaluating the use of MBIs with psychosis. Chadwick and colleagues (2009) conducted the first RCT examining the feasibility and efficacy of a MBI for distressing voices and paranoia, in which 22 schizophrenia patients were randomly allocated to the intervention or wait-list. The
intervention comprised 10 group-format sessions and incorporated discussions about mindfulness principles and formal mindfulness practices (in session and at home), followed by a further five weeks home practice (Chadwick et al., 2009a). There were no significant between-group differences found on outcome measures at post-treatment; however, change scores demonstrated significant improvements in clinical functioning and mindful responding to thoughts and images for the intervention group (Chadwick et al., 2009a). The authors concluded the overall findings to suggest mindfulness to be safe and therapeutic for people with distressing psychosis (Chadwick et al., 2009a).

Although it should be kept in mind that this study was a feasibility pilot, several factors limited the generalisability of these findings. For instance, power analyses revealed the sample size was less than half that required to achieve significant between-group results in these outcomes. Additionally, although all participants reported they engaged in home mindfulness practice, these activities were not formally recorded. Similarly, despite psychotic symptoms being referred to during in session guided practices, mindfulness recordings supplied on CD were more general and not specific to psychosis. Lastly, it is worth noting that the pre-post assessments were completed by the mindfulness trainer and may have been subject to therapist bias.

Another small feasibility study, following the adaptations of mindfulness for psychosis recommended by Chadwick, Taylor, and Abba (2005), was conducted by Langer, Cangas, Salcedo, and Fuentes (2012). Overall 18 participants with a schizophrenia spectrum disorder were randomly assigned to either MBCT or wait-list. Intervention participants completed eight MBCT group-format sessions, which incorporated meditation practices such as mindfulness of breathing, body scan and sitting meditation, with audio CDs and handouts used for home practice (Langer et al., 2012). In line with those recordings provided in the early trial by Chadwick and colleagues (2009a), the audio CDs given to participants for home practice included more general meditation practices and did not refer specifically to psychotic symptomatology. From the study findings, the authors concluded that low attrition rates provided support for the implementation of mindfulness for individuals with psychosis (Langer et al., 2012). However, participants were only required to attend 50% of sessions (4) to be included in the analysis. No significant between-group differences in
clinical symptoms were found at post-treatment (Langer et al., 2012). However, this primary outcome assessed symptom changes in schizophrenia, and it could be argued the measurement of changes in the emotional and functional impacts associated with such symptoms would be more appropriate following a third-wave intervention. In terms of process measures, MBCT participants demonstrated significantly greater mindful responding to distressing thoughts and images, compared to wait-list; although, no difference was noted in regard to experiential avoidance (Langer et al., 2012). However, the sample size of the experimental group that were included in post-intervention analyses was seven, which significantly limits generalisability of the findings.

Chien and Lee (2013) evaluated the efficacy of a group Mindfulness-Based Psychoeducation Program (MBPP) for schizophrenia patients in a large multi-centre trial in China. Following 12 group-format sessions incorporating mindfulness and schizophrenia Psychoeducation, it was revealed that MBPP participants demonstrated significantly improved illness insight and psychiatric symptom severity post-treatment, compared with TAU (Chien & Lee, 2013). These differences were maintained at 18-month follow-up and MBPP participants’ functioning and rehospitalisation rates (amount and duration) had also significantly improved at follow-up, in comparison with TAU (Chien & Lee, 2013). The authors concluded that these findings provided promise for the use of mindfulness training for the symptoms of psychosis, functioning and rehospitalisation and demonstrated the long-term nature of these treatment effects. However, similar to previous studies in the field (Chadwick et al., 2009a; Langer et al., 2012) the impacts of mindfulness interventions on the distress and disruption associated with psychotic symptoms was not explored by the authors. Additionally, in contrast with these aforementioned studies (Chadwick et al., 2009; Langer et al., 2012), the guided mindfulness practices employed in the MBPP program did not appear to be specific to psychotic symptoms. Given this, it would have been beneficial for the authors to assess the mechanisms contributing to observed symptom changes. Similarly, it is not specified how much ‘guided awareness practice’ or home practice was completed by participants and information regarding how many sessions participants attended or the cut off for ‘adequate dose’ was not provided.
To further replicate and expand on these encouraging findings, Chien and Thompson (2014) conducted a multi-centre trial to evaluate the efficacy for MBPP compared with active control. Overall, 107 schizophrenia patients were randomised to either MBPP, conventional psychoeducation or TAU (Chien & Thompson, 2014). Following a six-month intervention, MBPP participants demonstrated significant improvements in psychiatric symptom severity, psychosocial functioning (self-maintenance, social functioning and living skills) and duration of rehospitalisations at two-year follow-up, compared with conventional psychoeducation and TAU (Chien & Thompson, 2014). However, no between-group differences were found for the frequency of readmissions to hospital (Chien & Thompson, 2014). Similar to the previous research of Chien and Lee (2013), this study focused on outcomes of symptoms and functioning and failed to examine the effects of mindfulness training on the distress and disruption related to the experience of psychotic symptoms. Additionally, information regarding mindfulness training of the nurse therapist that led the awareness practices and discussions was not provided by the authors. Similar to those utilised in the previous trial of Chien and Lee (2013), the guided practices completed in the MBPP program did not appear to be specific to psychotic symptoms and information regarding the amount of in-session or home mindfulness practice completed by participants was not provided. Additionally, participants were requested to complete daily awareness exercises; however, recorded mindfulness exercises were not utilised for this.

Recently, López-Navarro and colleagues (2015) evaluated the effectiveness of a MBI for individuals with psychosis (89% schizophrenia). Overall, 44 participants were randomised to either a group-format MBI plus Integrated Rehabilitation Treatment (IRT) or IRT alone (López-Navarro et al., 2015). The IRT intervention consisted of psychopharmacology plus 26 individual sessions of CBT for symptom management, social skills training and psychoeducation (López-Navarro et al., 2015). Participants allocated to the MBI condition also engaged in 26 sessions of group-format mindfulness training, adapted for individuals with psychosis (López-Navarro et al., 2015). Mindfulness participants were provided with an audio CD of guided mindfulness practices and home practice was encouraged (López-Navarro et al., 2015). In contrast
with previous trials (e.g. Chadwick et al., 2009a; Chien & Lee, 2013; Chien & Thompson, 2014; Langer et al., 2012), not only did the in-session mindfulness practices refer specifically to psychotic symptoms, but those audio recordings provided for at home practice were also adapted for psychosis. It was concluded that low attrition rates and a lack of adverse symptom changes support the feasibility of this MBI for individuals with psychosis (López-Navarro et al., 2015). However, it should be noted that the authors failed to mention the average number of sessions completed by participants or the cut-off for determining sufficient dose.

Combining a MBI with IRT resulted in significantly improved psychological, physical and environmental quality of life (López-Navarro et al., 2015). However, no significant differences were found in psychotic symptoms or mindfulness (López-Navarro et al., 2015). The authors suggested the null findings for a change in mindfulness may be attributed to the use of a measure assessing mindfulness in everyday life, rather than mindful responding to thoughts, images or voices (Mindfulness Attention Awareness Scale; López-Navarro et al., 2015). Long-term maintenance of post-intervention gains were not able to be assessed as a follow-up period was not included in this study. Despite limitations, findings of this study were particularly encouraging, given this was the first RCT of a MBI for psychosis that examined changes in quality of life.

In 2016 Chadwick and colleagues trialled the first symptom-specific mindfulness protocol developed for individuals experiencing distressing voices. Overall, 108 participants with schizophrenia or schizoaffective disorder were randomised to group PBCT, consisting of 12 sessions including brief mindfulness practices (home practice using a guided audio recording was encouraged, but not recorded), discussions around mindful responding to voices and traditional cognitive therapy, or TAU (Chadwick et al., 2016). Facilitators of these group PBCT sessions were trained in either CBTp or mindfulness (Chadwick et al., 2016); however, it is important to note that as a result, adequate mindfulness training of the therapists was not ensured by this protocol design and independent audits of protocol adherence were not completed. Findings revealed that at post-treatment, intensity of voice-related distress, depression, and behavioural disturbance (controllability and subjective recovery) was
significantly improved in PBCT participants (Chadwick et al., 2016). However, only differences in depression maintained at 6-month follow-up, with no significant between-group differences reported for overall psychological distress or anxiety at post-intervention or follow-up points (Chadwick et al., 2016). Given a TAU control group rather than an active control was utilised the study findings cannot be distinguished from non-specific effects. Additionally, the primary outcome assessed at post-treatment was a broad measure of psychological distress and it may have been beneficial for the authors to examine more nuanced changes in symptom-related distress given the symptom-specific nature of the intervention protocol. Despite limitations, this was the first randomised trial to examine the impact of a MBI on psychotic symptom related distress and disruption. Given the premise of MBIs for psychosis is to alleviate distress associated with symptoms, rather than attempt to reduce the symptoms themselves, Chadwick and colleague’s (2016) finding for a reduction in voice-related distress is in line with mindfulness principles and very encouraging for the field. Further investigation of these symptom related impacts would have enriched our understanding of the ‘real-world’ benefits of such symptom-focused interventions for psychosis.

**Summary of findings from mindfulness trials.** Previous literature has proposed no symptom deterioration, low attrition rates and high session attendance rates, which provides support for the use of MBIs for individuals with psychosis. Despite inconsistencies across outcomes in trials of MBIs, significant improvements in functioning/quality of life and rehospitalisation rates have been reliably found (Chien & Lee, 2013; Chien & Thompson, 2014; López-Navarro et al., 2015). Conversely, changes in psychotic symptoms have been more inconsistent across studies (Chadwick et al., 2009a; Langer et al., 2012; López-Navarro et al., 2015), with only trials of MBPP finding improvement in psychiatric symptom severity (Chien & Lee, 2013; Chien & Thompson, 2014). It should be noted that one possible explanation for these inconsistencies are differences in illness progression. For instance, two of these trials excluded participants experiencing persistent psychotic symptoms and only included those who had received a diagnosis of a psychotic disorder within the previous 5 years (Chien & Lee, 2013; Chien & Thompson, 2014). Additionally, only two studies required participants to be experiencing current psychotic symptoms (Chadwick et al.,
2009a; Chadwick et al., 2016). Studies examining potential mechanisms of change (mindfulness and acceptance or experiential avoidance) have also had mixed results (López-Navarro et al., 2015); however, significant findings for changes in mindful responding to thoughts and images warrant further investigation (Chadwick et al., 2009a; Langer et al., 2012).

Despite encouraging findings revealed by this previous literature, several limitations should be addressed by future studies prior to conclusions being drawn regarding the efficacy for such approaches. For instance, several studies utilised a measure of psychotic symptoms as their primary outcome (e.g. Chien & Lee, 2013; Chien & Thompson, 2014; Langer et al., 2012). Given third-wave interventions are founded on the premise that distress results from one’s responses to difficult experiences, rather than the experiences themselves (Kabat-Zinn, 1994), a focus on symptom reduction is clearly at odds with the therapeutic targets of such interventions. Outcome measures in more recent studies have been more in line with mindfulness principles (quality of life and symptom associated distress) and have yielded encouraging findings (Chadwick et al., 2016; López-Navarro et al., 2015). Future trials should further examine these emotional and functional impacts associated with psychotic symptoms. Chadwick and colleagues (2016) mindfulness protocol is the first symptom-specific intervention to be trialled in the field. The psychosis literature has suggested symptom-specific interventions may be more effective than those more broadly focussed therapeutic packages, with increased treatment effects being noted in hallucination-specific CBTp protocols (van der Gaag et al., 2014). However, such protocols should be trialled against active controls to distinguish study outcomes from non-specific effects.

Although home mindfulness practice has been ‘encouraged’ by previous studies through the provision of audio CDs etc., home practice engagement has not formally been recorded. Given the amount of time spent practicing mindfulness has been associated with the cultivation of mindfulness skills and the degree of improvement in psychological symptoms, it would be beneficial for future mindfulness trials to record practice levels to allow for differences in mindfulness exposure between participants to be controlled (Carmody & Baer, 2008). Similarly, several trials failed to report the
average number of mindfulness sessions attended by participants (e.g. Chien & Lee, 2013; López-Navarro et al., 2015). Given the aforementioned association between mindfulness practice, skill development and outcome, it is important for studies to record and report this information to ensure generalisability of trial findings and aid dissemination into clinical practice.

Although several study protocols included specific adaptations for psychosis (e.g. Chadwick et al., 2009a; Langer et al., 2012; López-Navarro et al., 2015; Chadwick et al., 2016), it is important that guided mindfulness recordings provided to participants for home practice also refer specifically to psychotic symptoms to ensure generalisability of cultivated skills these experiences. Future studies should trial new ways of helping participants practice alternate ways of responding to psychotic experiences such as simulated recordings of voices or auditory hallucinations. Additionally, some previous trials neglected to included information relating to therapist training or employed mindfulness facilitators who did not have adequate mindfulness training or practice (e.g. Chien & Thompson, 2014; Chadwick et al., 2016). One advantage of these mindfulness interventions is that a high level of clinical skill is not required for delivery given the manualised rather than formulation-based format; however, it is important that mindfulness therapists have an adequate level of training and experience to ensure proficient training. A review of the literature revealed there have been no RCTs examining the effects of a MBI for psychosis in individual format. Given psychological interventions are most frequently delivered on an individual basis there is a need for research to examine this delivery modality. As has been observed for individual versus group CBTp, the delivery of one-to-one MBIs may also lead to increased treatment effects (van der Gaag et al., 2014).

Case studies of individual mindfulness protocols. Although no RCTs have utilised mindfulness protocols in an individual format, several case studies have evaluated the effectiveness of such interventions for the treatment of psychosis. These case studies have reported encouraging results (see Ellett, 2013; Newman Taylor, Harper, & Chadwick, 2009). Newman Taylor and colleagues (2009) described the use of individual mindfulness therapy, involving 12 individual sessions of guided mindfulness practice, with two men with schizophrenia experiencing distressing voices.
Following the intervention, reductions in belief conviction and voice-related distress, and increased mindful responding to voices were observed in both participants (Newman Taylor et al., 2009). Subjectively, the participants reported feeling less overwhelmed and better able to manage living with voices following treatment (Newman Taylor et al., 2009).

Similarly, Ellett (2013) reported on the use of a one-to-one mindfulness intervention with two men with psychosis who experienced distressing paranoid beliefs. The intervention involved six individual sessions that included guided mindfulness practice and reflection, as well as discussions about psychotic experience and symptom maintenance associated with habitual reactions (Ellett, 2013). Following a three-week baseline period and subsequent intervention, it was found that in comparison with the baseline period in which no systematic change was noted, both participants reported reductions in belief conviction, depression and anxiety, which were maintained at follow-up (Ellett, 2013). Additionally, greater mindfulness of distressing thoughts and images was reported by both participants following therapy and at one-month follow-up (Ellett, 2013).

Combined, these preliminary findings suggest mindfulness delivered in individual format may lead to the cultivation of mindfulness skills, and is potentially helpful for the symptom-specific and overall distress associated with psychosis, as well as providing an alternate relationship with psychotic experiences. However, further pilot studies of larger sample size are required to ascertain the acceptability, feasibility and potential outcomes of individual MBI protocols for psychosis.

2.2.4.2.7 Why mindfulness might help with distressing voices

Theoretical perspectives and proposed mechanisms

Strauss, Thomas, and Hayward (2015) have proposed numerous theoretical modes of action of MBIs for distressing voices: 1) mindful observation as opposed to becoming consumed by verbal dialogue with voices, 2) active acceptance as an alternative to habitual reactions to voices such as suppression or resistance, 3) decentring as a buffer for the negative voice content and cognitions commonly
experienced by voice-hearers, and 4) targeting the rumination and worry identified to be related to persistent voice hearing.

Analogous to the interventionist-causal paradigm that has been applied to other psychotic experiences (Brand et al., 2017; Farrelly, Peters, Azis, David, & Hunter, 2016; Freeman, 2011), it has been suggested that by developing targeted symptom-specific interventions, which reduce the confounds of other therapeutic processes, research is better able to study the efficacy for MBIs, and the possible mechanisms of change involved, with greater accuracy (C. Strauss et al., 2015; Thomas, 2015b). For instance, according to Strauss and colleagues (2015) previous qualitative literature has identified several potential mechanisms of change involved in mindfulness training for voices including: 1) decentring, 2) acceptance of voices, and 3) the reorientation of attention away from voices.

**Addressing impairments in attention**

Past research has reported significant improvements in attention processes such as attentional control, attentional switching or set-shifting and sustained attention, following mindfulness training (Chambers, Lo, & Allen, 2008; Jha, Krompinger, & Baime, 2007; Tang et al., 2007). Chambers and colleagues (2008) studied executive cognition in non-clinical individuals following a 10-day intensive mindfulness retreat. Following the retreat, they found mindfulness participants demonstrated greater sustained attention on the Internal Switching Task, compared with wait-list controls, suggesting that even short-term mindfulness training may enhance attention processes (Chambers et al., 2008).

Similarly, in a study by Tang and colleagues (2007), 40 students were randomised to either five days of mindfulness training or relaxation training. Following this short-term training, mindfulness participants showed significantly greater improvement on the Attention Network Task (ANT), compared with the relaxation group (Tang et al., 2007). Also using the ANT task, Jha and colleagues (2007) examined the impact of prior mindfulness training on specific subsystems of attention. At baseline, participants with prior experience demonstrated better attentional control (conflict management and performance accuracy) on the ANT task, compared with
controls (Jha et al., 2007). Following an eight-session MBSR course, mindfulness participants with no prior meditation experience were also found to have significantly greater attentional control on the ANT task, compared with controls (Jha et al., 2007).

Together, these findings suggest both short- and long-term mindfulness training is associated with improved executive attention. These outcomes may be particularly beneficial for voice-hearers, given previous research has identified decreased abilities in attentional control and switching, which as mentioned above, may result from increased attentional resources on the experience of hearing voices (Hugdahl, 2009; Siddi et al., 2017). Learning to switch attention between the experience of hearing voices and other tasks at hand may act as a protective buffer to becoming preoccupied with the experience and associated habitual reactions.

**Cross-sectional findings**

If mindfulness is beneficial for managing distressing voices, it would be expected that trait mindfulness would be associated with voice-related distress, disruption, and negative beliefs and reactions to voices. However, few studies, to date, have examined how individual differences in trait mindfulness may predict these voice impacts. In a study of 59 people with a diagnosis of schizophrenia, who were experiencing hearing voices, Chadwick, Barnbrook, and Newman-Taylor (2007) identified both general mindfulness of everyday living and mindfulness of voices to be significantly associated with negative affect. Mindful responding to voices was also found to be related to voice-related distress, negative beliefs about voices (malevolence and omnipotence) and resistant responding to voices (Chadwick et al., 2007).

In a sample of 50 individuals with psychosis experiencing persistent voices, E. Morris, Garety, and Peters (2014) identified a similar pattern of associations between non-judgemental acceptance, decreased resistance of voices and improved mood symptoms (depression and anxiety). However, unlike previous findings (Chadwick et al., 2007), no significant correlations were found between non-judgemental acceptance and voice-related distress and disruption (E. Morris et al., 2014). Further, results of regression analyses identified non-judgemental acceptance significantly predicted resistant responding to voices, but not mood or voice-related distress or disruption (E.
Morris et al., 2014). However, this study’s examination of only non-judgemental acceptance, rather than including other characteristics of trait mindfulness such as mindful observation and awareness, limit these findings (E. Morris et al., 2014).

Úbeda-Gómez and colleagues (2015) identified that mindfulness was negatively linked with voice-related distress and dissociative symptoms, in a sample of 51 clinical voice-hearers. Findings of a relationship between mindfulness and voice-related distress were consistent with previous results of Chadwick and colleagues (2007). Recently, Perona-Garcelán, Rodríguez-Testal, Senín-Calderón, Ruiz-Veguilla, and Hayward (2016) identified that mindfulness significantly predicted lower levels of depression and anxiety. It was also found that mindfulness negatively mediated an observed correlation between dysfunctional relational style to voices and mood symptoms (Perona-Garcelán et al., 2016).

Together, these findings suggest there is preliminary support for the idea that trait mindfulness may help individuals better manage the experience of hearing voices. However, notable limitations exist in past cross-sectional studies. For instance, nearly all of the aforementioned studies examined general mindfulness as a trait measure, rather than focusing on an individual’s ability to mindfully respond to voices (E. Morris et al., 2014; Perona-Garcelán et al., 2016; Úbeda-Gómez et al., 2015). Generalisability of the findings from the one study that did look at mindful responding to voices was restricted by the inclusion of an unvalidated voice-related distress rating, and use of the Beliefs About Voices Questionnaire–Revised (BAVQ-R) combined resistance scale. Given this scale comprises both emotional and behavioural responses to voices, items of voice-related emotional distress are also included.

An additional limitation of the literature is that findings for a relationship between mindfulness and voice-related distress are somewhat inconsistent across studies (see Chadwick et al., 2007; E. Morris et al., 2014; Úbeda-Gómez et al., 2015), and this does not appear to be the result of different measures of distress (see studies using the Psychotic Symptom Rating Scales, E. Morris et al., 2014; Úbeda-Gómez et al., 2015). Furthermore, the impact of voice topography (frequency, duration and intensity or loudness) and overall distress (depression and anxiety) on voice-related
negative impacts such as distress and disruption have not been controlled for in previous studies. It is particularly important these variables are considered as potential confounds when looking at the association between processes such as mindfulness and the impact of voices, as voice-related distress may be influenced by overall mood symptoms, and voice topography (Soppitt & Birchwood, 1997).

Negative voice impacts such as distress, disruption, and negative responses to voices that have been explored by prior cross-sectional studies are commonly targeted by psychological interventions.

**Intervention results**

Despite several RCTs of MBIs for psychosis being reported by previous literature (Chadwick et al., 2009a; Chadwick et al., 2016; Chien & Lee, 2013; Chien & Thompson, 2014; Langer et al., 2012; López-Navarro et al., 2015), only one of these trials utilised a protocol for and considered outcomes on persistent voices (Chadwick et al., 2016). As mentioned above, Chadwick and colleagues (2016) found significant between group post-intervention effects on negative voice impacts, following a course of PBCT. These results, in combination with findings from the previously described case studies (Newman Taylor et al., 2009), provide promise for the use of mindfulness for individuals experiencing persistent distressing voices.
CHAPTER 2: LITERATURE REVIEW

2.3 The Present Investigation

This literature review demonstrates that psychotic disorders are severe psychiatric illnesses that have been related to many individual and societal burdens. Cognitive, negative and positive symptoms are characteristic of psychotic disorders and past research suggests perceptual hallucinations such as voices occur in most individuals with psychosis. These symptoms are often, but not always, experienced as distressing and previous literature suggests one’s relationship with the voice-hearing experience predicts habitual reactions such as resistance. Past research has linked negative responses to voices to increased frequency and intensity of symptoms and associated distress. Furthermore, review of the literature has also identified ineffective reactions to positive symptoms, such as voices to be related to decreased subjective wellbeing and impaired social functioning. Psychological interventions for psychosis were developed for the treatment of refractory positive symptoms such as persistent distressing voices. Despite CBTp being the gold standard approach for the treatment of psychosis, previous literature has identified several issues with dissemination such as the advanced level of clinical skills required for delivery. It has been suggested, more focussed psychological interventions may be simpler to disseminate than formulation-based, multi-component approaches such as CBTp. Recently, third-wave interventions for psychosis have continued to emerge within the literature and have produced promising findings.

However, a review of the literature has identified that several trials have been published since previous meta-analyses were conducted in this area, including two large RCTs. Therefore, further examination of the impact of mindfulness-, acceptance-, and compassion-based approaches is required to determine the efficacy of these third-wave interventions for psychosis. Additionally, despite previous literature outlining several theoretical benefits for the use of mindfulness for distressing voices and the primary evidence of cross-sectional findings, more empirical research is needed to identify whether mindfulness helps individuals to adapt to the experience of hearing voices. Particularly, in relation to the negative voice impacts such as distress, disruption, and resistant responding that are commonly targeted by psychological interventions. Moreover, encouraging findings from intervention studies of symptom-specific
mindfulness protocols suggest further research is needed to determine the feasibility and potential efficacy of such approaches for distressing voices in a pragmatic one-to-one format that will aid therapeutic dissemination.

The present investigation aims to address these gaps in the literature. Firstly, by conducting a comprehensive and up-to-date meta-analysis of RCTs, with an aim of determining the efficacy of third-wave interventions for psychosis. Secondly, through the provision of further information about the relationships between mindful relating to voices and voice-related negative impacts and whether mindfulness of voices predicts these negative impacts. Lastly, the present investigation aims to determine the feasibility and potentially efficacy of an individual mindfulness-based intervention for the treatment of distressing voices.

2.4 Research Aims

To guide this dissertation in addressing the larger thesis goal outlined in Chapter 1, additional specific research aims were generated. Each of these research aims were chosen to build systematically, as to provide a deeper understanding of the empirical basis of third-wave interventions for psychosis, specifically whether mindfulness could help individuals manage the experience of hearing distressing voices and whether a one-to-one mindfulness intervention would be feasible and effective for persistent voice-hearing. The specific research aims presented in the following sections provide a foundation for the aims and hypotheses outlined in the empirical studies described in chapters 4, 5 and 6.

Research Aim 1: Determine the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis

Findings from previous meta-analyses in this area have identified small to moderate treatment effects for third-wave interventions on psychotic symptoms (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013). However, the limited number of studies available for both these previous meta-analyses precluded thorough examination of between-group treatment effects, particularly in relation to MBIs. Given two large RCTs have been published since these meta-analytic studies were reported (Chadwick
et al., 2016; Shawyer et al., 2016), the first research aim of this thesis was to determine the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis. This research aim will be addressed by conducting a comprehensive and up-to-date meta-analysis of RCTs of mindfulness-, acceptance-, and compassion-based approaches for psychosis. Study 1 was designed to specifically address this research aim and is presented in Chapter 4 of the current thesis.

Research Aim 2: To establish whether mindfulness is associated with better adaptation to the experience of hearing voices

Cross-sectional literature provides preliminary support for the idea that trait mindfulness may help individuals better manage the experience of hearing voices. For instance, trait mindfulness has been linked to voice-related impacts such as mood symptoms (Perona-Garcelán et al., 2016; Úbeda-Gómez et al., 2015), voice-related distress (Chadwick et al., 2007; Úbeda-Gómez et al., 2015), negative beliefs about voices (Chadwick et al., 2007), and resistant responding (Chadwick et al., 2007; E. Morris et al., 2014). However, most of these studies have examined general trait mindfulness, rather than specific mindful responding to voices. Additionally, the influence of voice topography and mood symptoms on the relationship between mindfulness of voices and voice-related impacts has not been controlled for by previous studies. Therefore, research aim 2 of this thesis was to establish whether mindfulness is associated with better adaptation to the experience of hearing voices. This research aim will be addressed by examining the relationships between mindful relating to voices and negative voice impacts such as distress, disruption and resistance and by exploring whether mindfulness of voices significantly predicts these negative impacts, once related voice topography and mood symptoms have been controlled for. Study 2 of this thesis addressed this research aim and is presented in Chapter 5.

Research Aim 3: Develop an individual mindfulness-based protocol for distressing voices and determine the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers

An examination of the literature has revealed only one RCT has utilised a mindfulness protocol for and considered outcomes on persistent voices (Chadwick et
al., 2016). This study found significant between group effects on negative voice impacts, following a course of PBCT (Chadwick et al., 2016). Although none of the existing RCTs of MBIs for psychosis have used a one-to-one delivery format, preliminary findings of case studies have identified mindfulness to potentially lead to the cultivation of mindfulness skills and may be helpful for management of the symptom-specific and overall distress associated with persistent voices (Newman Taylor et al., 2009). These intervention studies combined with cross-sectional findings offer promise for further investigation of the use of mindfulness for distressing voices, particularly in individual format. Consequently, pilot studies are needed to ascertain the feasibility and potential efficacy for individual mindfulness-based approaches for voices. Research aim 3 aimed to fill this gap in the literature by developing an individual mindfulness-based protocol for distressing voices and examining the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers. Study 3 was designed to specifically address this research aim and is presented in Chapter 6 of this thesis.

**Research Aim 4: Obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention**

RCTs of mindfulness interventions for psychosis that have assessed potential mechanisms of change have produced mixed findings (López-Navarro et al., 2015); however, significant changes found for mindfulness of thoughts and images deserve additional examination (Chadwick et al., 2009a; Langer et al., 2012). Furthermore, previously identified improvements in attentional processes following mindfulness training (Chambers et al., 2008; Jha et al., 2007; Tang et al., 2007) may be of particular benefit to voice-hearers, given difficulties with decreased abilities in attentional control and switching (Hugdahl, 2009; Siddi et al., 2017). However, the effects of MBIs for psychosis on processes of attention have not been explored by previous research. Therefore, research aim 4 was to obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention. Study 3 addressed this research aim and is presented in Chapter 6 of the current thesis.
CHAPTER 3: METHODS
3.1 Chapter Guide

Given this dissertation has been formatted to include associated papers, each empirical chapter (Chapters 4, 5 and 6) has been prepared for publication in an academic peer-reviewed journal and are either in press or under review with consideration to publish. Scientific journals often preclude detailed methodological sections due to restrictions regarding manuscript length. Therefore, this chapter provides additional methodological information regarding ethical clearance, study design, recruitment methods and participants, materials, procedures and statistical analyses. This chapter also provides information relating to the overall thesis design and how each of the empirical studies inter-relate and function together to address the thesis goal outlined in Chapter 1 and the research aims stated in Chapter 2.
3.2 Overview of Method and Design

This thesis was designed to achieve an overall research goal: to empirically test the use of mindfulness as a therapeutic tool for managing the distress and disruption associated with psychotic symptoms, specifically distressing voices. As described in chapter 2, several specific research aims (section 2.4) were generated to guide the thesis in addressing this overarching goal, and three broad methodological approaches were used. The first empirical study (chapter 4), aligning with research aim 1, utilised meta-analysis to draw conclusions about the impact of third-wave interventions when data from available studies in the literature were pooled. This considered the impact of third-wave approaches on both ratings of mindfulness, and on distress and disruption associated with voices and other psychotic symptoms. The second empirical study (chapter 5), aligning with research aim 2, collected and analysed cross-sectional data on the relationship between individual differences in mindful relating to voices and individual differences in the impact of voices, when phenomenological differences were controlled for. The third empirical study (chapter 6), aligning with research aims 3 and 4, developed a focused intervention that more specifically targeted the application of mindfulness to voices. This utilised a pre-post experimental design, which allowed testing of the acceptability and feasibility of mindfulness as a specific therapeutic method, and the ability to consider its impact on outcomes (research aim 3) and consider potential mechanisms of change (research aim 4).

The three studies included within this thesis employed several quantitative and qualitative methodologies including clinical interviews, paper-and-pencil questionnaires, computer-based tasks, and semi-structured interviews. The use of this broad range of methods allowed for a rich level of information to be collected from participants. A variety of parametric and non-parametric statistical analyses were conducted to explore the collected data across the three studies including meta-analysis and meta-regression, correlational analyses, hierarchical multiple regression, paired-samples t-tests, Wilcoxon Signed-Ranks tests, and the Reliable Change Index (RCI). These statistical analyses were conducted using either Comprehensive Meta-Analysis (CMA) or the Statistical Package for the Social Sciences (SPSS) Version 24 (SPSS Limited), or were calculated by hand (e.g. RCI).
When the candidate was considering which approaches to utilise during the
design phase of the three studies several issues were taken into account. For instance,
given this was the first time the iMPV intervention had been delivered, the candidate
felt it was appropriate to conduct a pre-post pilot in study 3 to ascertain the acceptability
and feasibility of this protocol. This decision was further supported by the existing
literature, as this was the first protocol to employ an individual modality. Additionally,
given only one trial had examined a MBI specifically for distressing voices (see
Chadwick et al., 2016), the candidate and her supervisory team decided a cross-
sectional exploration of mindfulness and related negative voice impacts would be
appropriate to provide empirical support to guide the development of the iMPV
program conducted in study 3.

Furthermore, due to pragmatics regarding recruitment and implementation of the
pre-post trial in study 3, the final sample size was small. Therefore, the candidate and
her supervisory team felt it was necessary to utilise approaches within the design of
studies 1 and 2 that enabled more advanced statistical analyses to be conducted, to
demonstrate the candidate’s abilities within this area. For instance, it was determined
that a cross-sectional design in study 2 would enable for a larger sample size and
consequently, the ability to conduct more advanced multivariate analyses. Similarly, the
use of meta-analysis in study 1 required the candidate to extend her professional
development through learning and implementing this statistical procedure.
3.3 Study 1

As psychological therapies for psychosis have continued to develop, there has been increasing popularity for third-wave approaches that focus on mindfulness and acceptance. Previous findings from two meta-analyses in the field have found small to moderate treatment effects for third-wave approaches on psychotic symptoms (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013). However, due to the small number of randomised trials in the field, previous meta-analyses have been limited in their exploration of between-group treatment effects, particularly in relation to positive symptoms and MBIs. Since the previous two meta-analyses were produced there has been two further large RCTs published (Chadwick et al., 2016; Shawyer et al., 2016). Consequently, for this thesis an updated and comprehensive meta-analysis of RCTs in the field was conducted to address research aim 1: that is, determining the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis.

3.3.1 Experimental Design

A meta-analytic approach was chosen to address aim 1 due to its ability to combine data from several different studies in an objective way, to establish a common effect. This approach enabled the inclusion of, and estimation of, effects for studies examining a broad range of third-wave interventions (i.e., mindfulness-, acceptance- and compassion-based) in the one analysis.

3.3.2 Methodological Considerations

3.3.2.1 Eligibility criteria

Studies were included in the meta-analysis if they met the following criteria: 1) included quantitative measures of the selected primary or secondary outcomes; 2) employed a randomised controlled design, to ensure a high level of methodological rigor; 3) examined a mindfulness-, acceptance-, or compassion-based intervention protocol for psychosis, as from a theoretical perspective all these third-wave approaches, that centre non-judgemental and self-compassionate acceptance of symptoms, are likely to be of particular advantage to people with psychosis; and 4)
included participants diagnosed with a psychotic disorder, with > 50% having a schizophrenia/schizoaffective disorder diagnosis, to ensure inclusion of both affective and non-affective psychosis. Studies were excluded based on the following criteria: 1) they relied on self-reported symptoms rather than a structured diagnostic interview, this ensured that all studies included participants that had a diagnosis of a psychotic disorder; 2) they included participants with comorbid intellectual disability or substance dependence, which can interfere with observed treatment effects; 3) they utilised previously reported data, to ensure independence of treatment effects; or 4) the data had not been published in a peer-reviewed journal, to ensure a high standard of included research data was maintained.

3.3.2.2 Search strategy

Key terms for the systematic search were selected based on previously reported search terms of past meta-analyses (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013), as well as keywords identified by hand searches of seminal trials within the field. To enable the broad retrieval of results, a keyword search was conducted, which included journal and article titles, author names and abstracts. Additionally, boolean search operators and wildcards (e.g. asterisks) were utilised to ensure a more focused or refined return of results, whilst retrieving various words using minimal root terms (e.g. paranoi*). The following search terms were combined: mindfulness, meditation, acceptance, person-based cognitive therapy, compassion-focused, or compassionate mind; and schizophrenia, psychotic, psychosis, paranoi*, delusion*, hallucination*, distressing voices, voice hearing, or hearing voice*.

3.3.2.3 Selected outcomes

The primary outcome selected for this meta-analysis, psychotic symptoms, provided a pragmatic method for combining data from a number of trials. However, given third-wave interventions for psychosis aim to alleviate distress associated with symptoms, rather than to reduce psychotic symptom severity, it is important to note such symptom measures are relatively indirect to the intended outcomes of psychological interventions. As few studies have reported on the more specific goals of third-wave approaches such as symptom-related distress and functioning, the pooling of
such treatment effects was limited to secondary analyses. During the outcome selection process, it was decided not to include rehospitalisation data. Given recent RCTs of third-wave approaches for psychosis have not included outcomes relating to rehospitalisation, the reanalysis of this data would not provide any information over and above that of previous meta-analyses.

3.3.2.4 Data collection

Data was extracted from the manuscripts of the included studies by the candidate. In situations where required data items were not reported within the article, the candidate contacted the relevant authors via email with a request for provision of the necessary data. This was sent to the candidate in the form of a summary of relevant variables or original data files (excel spreadsheets or SPSS data files). The candidate then extracted the required items and entered them into the Comprehensive Meta-Analysis software. There was one study whereby the authors reported only change scores within the manuscript, which were unable to be combined with final values (Chadwick, Hughes, Russell, Russell, & Dagnan, 2009b). This is due to a risk for giving extra weight to studies reporting change scores, as the variance (standard deviations) reported by such studies is usually less than those using final values (S. B. Morris & DeShon, 2002). Consequently, this study was excluded from final analyses.

3.3.2.5 Statistical analyses

The meta-analytic method allowed for the exploration of subgroup analyses, and comparisons across intervention protocols (mindfulness or acceptance-based) and control types (active or TAU). Given the assumed variance within and between included studies, a random-effects model was employed that accounted for these variations when assigning study weights (Borenstein, Hedges, Higgins, & Rothstein, 2010). Lastly, to assess the impact of covariates or moderator variables on the pooled treatment effect, a meta-regression was conducted with three continuous moderators: 1) study quality using the Clinical Trial Assessment Measure (CTAM) total score, 2) number of treatment sessions provided by the intervention, and 3) treatment duration in hours.
CHAPTER 3: METHODS

**Risk of bias in individual studies**

The CTAM (Tarrier & Wykes, 2004) was used to assess the quality of included studies. The CTAM consists of 15 items relating to six areas of study design: sample size and recruitment method, allocation to treatment, assessment of outcome, control groups, description of treatments, and analysis (Tarrier & Wykes, 2004). The CTAM has demonstrated adequate internal consistency with a Cronbach’s $\alpha$ of 0.69 and excellent inter-rater reliability with a coefficient of 0.96 (Tarrier & Wykes, 2004). Additionally, excellent convergent validity with coefficients ranging between 0.79 and 0.97 with three previously validated quality assessment measures, provides evidence of construct validity (Tarrier & Wykes, 2004).

**Publication bias**

As studies reporting significant and large effects are more likely to be published than those with small or null findings, it was important to assess the potential influence of publication bias for the meta-analytic results (Borenstein, Hedges, Higgins, & Rothstein, 2009). This was examined using both Rosenthal’s (1979) and Orwin’s (1983) fail-safe $N$ methods. Rosenthal’s (1979) fail-safe $N$ establishes how many missing studies of nonsignificant findings are required to nullify the pooled effect size. In comparison, Orwin’s (1983) approach to fail-safe $N$ extends on this by establishing the number of studies with negligible effects that would be required to render the combined treatment effect trivial in size. Both methods were employed in study 1, as the candidate felt in relation to publication bias, it was important to not only examine significance, but also the size of the established treatment effects.

**3.3.2.6 Funding**

The candidate was awarded with a $5,000 grant from the Barbara Dicker Brain Sciences Foundation to conduct studies 1 and 3. This funding covered costs relating to the purchasing of a license for Comprehensive Meta-Analysis.
3.4 Study 2

Study 2 of this thesis formed part of a larger research project conducted within the same Cognitive Neuropsychiatry Laboratory, at the Monash Alfred Psychiatry Research Centre (MAPrc). Participant recruitment, screening and data collection were conducted by two researchers within the laboratory (Dr Wei Lin Toh and Ms Monique Scott). Specific study design, data screening and analysis, and preparation of the manuscript were conducted by the candidate. Meta-analytic findings from study 1 indicated that third-wave interventions are effective for the treatment of psychotic symptoms and depressive symptoms in individuals with psychosis. Additionally, mindfulness was found to be a potential mechanism of change in third-wave approaches. However, only one RCT identified by this meta-analysis utilised a mindfulness protocol for, and observed outcomes on, persistent voices. Therefore, the author utilised this collected data-set to address research aim 2 of this thesis: establishing whether mindfulness can help people to adapt to the experience of hearing voices and to pinpoint specific targets for psychological interventions for persistent voices.

3.4.1 Experimental Design

A cross-sectional design was implemented within the second study. Data was collected at one time-point (or two sessions within a one-week period depending on the patient’s treatment status, e.g. inpatient), across a range of quantitative measures from one sample of participants.

3.4.2 Recruitment Procedures

3.4.2.1 Source of participants

Participants were recruited from inpatient and outpatient mental health services at The Alfred Hospital, The Melbourne Clinic, the Epworth Mental Health Clinic and St Vincent’s Hospital, Melbourne Australia. This involved the use of recruitment flyers located in waiting rooms, as well as the identification of potential participants from psychiatrists, psychologists, nurses and case-workers. Additionally, potential participants were identified by treating clinicians at a specialist Voices Clinic and
through associated databases (Voices Research Participant Registry and the MAPrc Participant Database). Lastly, participants responded to online and print advertisements such as those listed on Gumtree, Facebook and MX Magazine.

### 3.4.2.2 Inclusion Exclusion Criteria

It is important to note that participant inclusion and exclusion criteria for Study 2 differed to that of the larger research project. The larger project included both non-clinical voice-hearers and individuals with a previous history of voice-hearing. Although data was available on these two cohorts they were considered unrelated to the overall thesis narrative and specific research aims and were not included in the Study 2 analysis. Participants were included in the current study if they: 1) had a diagnosis of an affective or non-affective psychotic disorder (schizophrenia, schizoaffective disorder, bipolar disorder, or major depressive disorder), 2) were over 18 years of age, and 3) had experienced hearing voices within the last week. This last criterion was chosen due to the time frame outlined by several of the standardised measures utilised in this study (e.g. PSYRATS and BAVQ-R). Participants were excluded from the study if they had a history of neurological disorder such as epilepsy or stroke, or had received electroconvulsive therapy in the past six months. As this study was also examining the phenomenology of voice-hearing, individuals with a current substance dependence disorder were excluded to ensure voice characteristics were not related to long-term substance use. To ensure informed consent and meaningful information could be obtained in the context of the clinical interview, participants who had a Wechsler Test of Adult Reading (WTAR; Wechsler, 2001) estimated IQ of less than 70 were also excluded.

### 3.4.2.3 Participant contact and screening

Two researchers contacted potential participants that had either responded to advertisements or had been identified through the additional recruitment sources by telephone, email or in person (inpatients). On first contact, the researchers provided participants with a brief overview of the project. To ascertain eligibility, a basic screen including a series of questions relating to the inclusion/exclusion criteria was conducted and interested and eligible participants were sent copies of the Participant Informed
Consent Form (see Appendix B) at least 24 hours prior to the researchers following up with participants.

### 3.4.3 Participants

Overall, 62 participants were recruited. Participants had a diagnosis of schizophrenia (48.4%), schizoaffective disorder (17.7%), bipolar disorder (19.4%), or major depressive disorder (14.5%).

### 3.4.4 Materials

As this study formed part of a larger umbrella project, an extensive battery of assessment measures was administered to participants. However, only the measures utilised in study 2, and relating to the specified research aim, will be discussed in the following section.

#### 3.4.4.1 General assessment measures

**Demographic questionnaire**

Respondents were asked to complete a demographic questionnaire that included items designed to ascertain participants’ age, gender, clinical diagnosis, symptom onset age, and psychiatric medication usage.

**Wechsler Test of Adult Reading (WTAR)**

The WTAR was designed to be an estimate of intellectual functioning and premorbid verbal intelligence in adults aged between 16 and 89 years (E. Strauss, Sherman, & Spreen, 2006). It consists of 50 irregularly spelled words that participants are required to pronounce, such as ‘lugubrious’ and ‘fecund’, with correct pronunciations equating to a score of one. Individual scores are summed to calculate a total raw score ranging from 1 to 50, with higher scores indicating greater word reading performance. The WTAR has been found to show excellent reliability with internal consistency coefficients ranging from 0.87-0.95 and test-retest reliability correlations of 0.90 and above (E. Strauss et al., 2006). Good convergent evidence for construct validity has also been found with associations with the American National Adult
Reading Test (AMNART; $r = 0.90$) and the Wechsler Adult Intelligence Scale – Third edition ($r = 0.75$; E. Strauss et al., 2006). The WTAR was administered to participants as an estimate of premorbid IQ, with individuals receiving a score of $< 70$ being excluded from participation in the study.

### 3.4.4.2 Voices measures

**Psychotic Symptoms Rating Scales (PSYRATS) – Auditory Hallucinations**

The PSYRATS \( (Haddock, McCarron, Tarrier, \& Faragher, 1999) \) was chosen to obtain specific information about voice-related distress, disruption and voice topography (frequency, duration, loudness). This clinician-rated measure of the specific characteristics of auditory hallucinations has been consistently utilised by previous research (see relevant cross-sectional studies, E. Morris et al., 2014; Úbeda-Gómez et al., 2015). The PSYRATS has demonstrated excellent inter-rater reliability with items producing coefficients between 0.78 and 0.90 (Haddock et al., 1999). It also shows good test-retest reliability and validity (Haddock et al., 1999).

**Beliefs About Voices Questionnaire – Revised (BAVQ-R)**

The resistance subscale of the BAVQ-R (Chadwick et al., 2000) was used as a measure of negative responding to voices. This subscale includes both behavioural and emotional items relating to resistant responding and has been used by previous cross-sectional studies in the field (Chadwick et al., 2007; E. Morris et al., 2014). Although previous studies have often reported a single resistance scale, these behavioural and emotional items can also be considered separately (Chadwick et al., 2000). During analysis of study 2 data, resistance was first reported as a single scale (including behavioural and emotional items) and then explored further using only the behavioural items, to ensure items of emotional distress were not confounding the results. The resistance subscale of the BAVQ-R has demonstrated good reliability, with a Cronbach’s $\alpha$ of 0.85 and good construct validity shown as strong relationships ($> 0.30$) with other BAVQ-R subscales (malevolence and omnipotence) and measures of anxiety and depression (Chadwick et al., 2000).
3.4.4.3 Mood measures

Beck Depression Inventory–II (BDI – II)

The BDI-II (Beck, Steer, & Brown, 1996) is a self-report measure of severity of depressive symptomatology. It has been widely used within the literature, particularly by related cross-sectional studies (see E. Morris et al., 2014; Perona-Garcelán et al., 2016). The BDI-II has demonstrated a high level of reliability with a reported Cronbach’s $\alpha$ of 0.93, suggesting good internal consistency (Beck et al., 1996) and good construct validity with positive associations with self-reported depressive symptoms (Whisman, Perez, & Ramel, 2000).

Beck Anxiety Inventory (BAI)

The BAI (Beck & Steer, 1990) is a self-report measure of the intensity of anxiety symptoms. It has been widely used by past research and specifically within related cross-sectional studies within the field (see E. Morris et al., 2014; Perona-Garcelán et al., 2016). The BAI has demonstrated good reliability, with a Cronbach’s $\alpha$ of 0.92 (Beck & Steer, 1990) and adequate construct validity with moderate correlations with other self-report measures of anxiety (Osman, Kopper, Barrios, Osman, & Wade, 1997).

3.4.4.4 Mindfulness measure

Previous literature has identified that mindfulness as a construct consists of two levels: trait and state. Trait mindfulness refers to an individual’s natural tendency to be mindful, whereas state mindfulness refers to one’s ability to be mindful during formal mindfulness practices (Dudley, Eames, Mulligan, & Fisher, 2017). Given this study aimed to explore associations between participants’ natural disposition to mindfully relate to voices and voice-related negative impacts, it was decided a trait mindfulness measure would be the most appropriate way to assess this (Siegling & Petrides, 2014). This is in line with previous literature, which outlines the objective of cross-sectional research in assessing individual differences in trait mindfulness in samples without significant mindfulness meditation experience (Dudley et al., 2017).
Southampton Mindfulness of Voices Questionnaire (SMVQ)

The SMVQ (Chadwick et al., 2007) assesses the amount in which individuals mindfully respond to the experience of hearing voices. This questionnaire was specifically chosen in comparison to the SMQ (a measure of mindful responding to thoughts and images) as most previous cross-sectional research in this field has looked at mindfulness as a general trait measure, rather than specifically at an individual’s ability to relate mindfully to their voices (e.g. E. Morris et al., 2014; Perona-Garcelán et al., 2016; Úbeda-Gómez et al., 2015). The SMVQ has demonstrated a good level of internal reliability, with a Cronbach’s $\alpha$ of 0.84 and moderate concurrent validity with a measure of everyday mindfulness (MAAS; Chadwick et al., 2007).

3.4.5 Procedure

Following assessments of eligibility, outpatients who were interested in participating in the study were mailed the demographic and self-report questionnaires to complete, prior to the assessment session. Conversely, inpatients were administered the demographic and self-report questionnaires by the researchers in an additional assessment session (within the same one-week period). Assessment sessions were conducted at either MAPrc or the Inpatient Psychiatric Units of The Alfred Hospital, The Melbourne Clinic, the Epworth Mental Health Clinic, or St Vincent’s Hospital. Following provision of a hard copy of the PICF, which included the aims, rationale and potential benefits and risks of the study, written consent was obtained. Subsequently, one of two trained researchers administered the clinician-rated measures. All participants were reimbursed $50 to cover their time and travel costs.

3.4.6 Methodological Considerations

3.4.6.1 Ethical Clearance

Ethical approval to collect the data was originally approved by five independent Human Research Ethics Committees (HREC): The Alfred Hospital, The Melbourne Clinic, the Epworth Hospital, St Vincent’s Hospital and Swinburne University of Technology (see Appendix A). All procedures outlined in study 2 were conducted in line with this ethical clearance. Participant data was then entered into the Genetic and
Cognitive Explanations for Mental Illness (CAGEMIS) database, which was also granted ethical clearance from The Alfred Hospital HREC for the continued use of the data for the purposes of related research projects conducted within the Cognitive Neuropsychiatry Laboratory at MAPrc, such as the current study (see Appendix A).

3.4.6.2 Funding

The candidate’s supervisors, Associate Professor Neil Thomas and Professor Susan Rossell, were awarded with a grant from the Barbara Dicker Brain Sciences Foundation to conduct the larger study, in which the data for study 2 was obtained. This funding covered costs relating to participant reimbursement ($50 per participant).

3.4.6.3 Statistical Analysis

The descriptive statistics of the measures included in study 2 revealed that symptom levels (auditory hallucinations, depression and anxiety) and scores for resistance to voices reported by the current sample were similar to previously reported samples (Chadwick et al., 2007; Haddock et al., 1999; E. Morris et al., 2014; Perona-Garcelán et al., 2016); although, levels of mindful responding to voices for this sample were somewhat higher than reported in previous studies (Chadwick et al., 2007; Chadwick et al., 2009b).

Prior to analyses, assumption testing was conducted to assess the suitability of the data for hierarchical multiple regression. Following inspection of the frequency table, it was found that a small percentage of data was missing from each of the variables (<5% per variable); cases were therefore excluded pairwise for all further statistical analyses. Assumption testing revealed the data met the assumption of multicollinearity, with correlations between independent variables <.7, and tolerance and VIF values of >0.10 and <10, respectively (Field, 2013). Likewise, inspection of the normal probability plots and scatterplots revealed normality of residuals for all variables (Field, 2013). Given statistical analyses were based on previous literature, the alpha level for all statistical analyses was set at .05.
3.5 Study 3

It should be noted that due to minor amendments to the overall thesis structure over the duration of the candidature and practicalities with recruitment and data collection, study 3 was conducted in parallel to study 2. Hence study 3 was designed on the basis of the literature review and findings from study 1, but was not shaped by findings of study 2, particularly in relation to chosen outcome variables.

Findings from the literature review and study 1 suggested that third-wave approaches for psychosis show effects on measures of overall psychotic symptoms and depressive symptoms. Additionally, larger effect sizes for mindfulness protocols on psychotic symptoms, compared with ACT studies, suggested that mindfulness may be more beneficial in promoting effective change within the context of psychosis. This was supported by changes being observed for measures of mindfulness more readily than for measures of acceptance. However, only one trial was identified that utilised a mindfulness protocol specifically for persisting voices, few trials were identified that measured outcomes on persisting voices, and no studies investigating the effects of mindfulness delivered in one-to-one format were identified. Due to psychological interventions commonly being delivered on an individual basis, we proposed that the examination of this delivery modality is key for future research.

In light of this, study 3 was designed to address research aims 3 and 4: to develop an individual mindfulness-based protocol for distressing voices and determine the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers, and to obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention.

3.5.1 Experimental Design

Given that this was the first time this mindfulness protocol had been delivered the candidate designed the initial phase of this study to be a pre-post pilot. It was decided that given this first phase was an internal pilot it would be ethically more appropriate for the first four participants recruited into the study to complete the assessment measures at only two time points, before and after the intervention.
(approximately one month apart; Time 1 and Time 2). Following this, the study employed a baseline controlled experimental design, which included a baseline period with all the participants recruited during this phase completing the assessment measures at two pre-intervention time points one month apart (Time 0 and Time 1), as well as post-treatment (Time 2) and a follow-up two months later (Time 3).

However, given pragmatic difficulties recruiting this particular sample of individuals during the course of a four-year PhD candidature, the final sample size in this second recruitment phase lacked statistical power. Consequently, the candidate, under the guidance of supervision, decided to examine whether data from the two recruitment phases could be combined into a pre-post experimental design, as a method for maximising numbers for analyses. Analyses revealed that differences on measures between the two pre-intervention time points (Time 0 and Time 1) in data pertaining to the second recruitment phase were all small and non-significant \((p > .1)\). Consequently, only pre-intervention data from Time 1 was included in further analyses, and the four cases from the initial phase of the study were included in Time 1 to Time 2 contrasts.

3.5.2 Recruitment Procedures

3.5.2.1 Source of participants

Several different avenues were engaged during recruitment. One source of recruitment was a specialist Voices Clinic in Melbourne, Australia and through an associated database (Voices Research Participant Registry). Clients who had previously engaged therapeutic services at the clinic, and had suggested they would like to be informed of potential research opportunities, were contacted by the candidate via mail and followed up by telephone. Additionally, new clients were offered the opportunity to participate in the mindfulness trial prior to the standard course of CBTp delivered through the clinic. Psychiatrists, psychologists and case workers at the Alfred Hospital Inpatient Psychiatric Unit and outpatient clinics, as well as community health centres were also approached with information about the study. Similarly, the candidate was informed of potential participants from peer-workers at Voices Vic, a peer-led program for voice hearers following the approach of the Hearing Voices Movement (Corstens et al., 2014), that is run by a non-government organisation, Uniting Care. Lastly,
participants responded to online and print advertisements listed on social media pages and newsletters of the Voices Clinic and Voices Vic.

### 3.5.2.2 Inclusion Exclusion Criteria

Despite studies 1 and 2 including participants with both affective and non-affective psychosis, to be included in study 3, participants required a previous diagnosis of schizophrenia or schizoaffective disorder, which was confirmed during the clinical interview. Participants included needed to 1) be aged between 18 and 65 years, 2) have experienced hearing persistent medication-resistant voices for more than two years, and 3) the voices were experienced at least once per week. This last criterion was set due to the time-frame of the outcome measures utilised in the study (e.g. the Subjective Experience of Psychosis Scale; SEPS and the PSYRATS). Given the current study included a neurocognitive battery, participants were excluded from the study if they had a history of neurological illness such as stroke or epilepsy or a past head injury or significant loss of consciousness. Similarly, due to the verbal nature of several of the included screening and self-report measures (e.g. WTAR, SEPS and SMQ) participants were excluded if English was their second spoken language. As this study was also examining pre-post changes in the phenomenology of voice-hearing, individuals with a current substance dependence disorder were excluded to ensure changes in voice characteristics were not related to substance abuse. Exclusion was also made if participants had commenced a new antipsychotic medication within the previous two months, given impacts on the severity and experience of psychotic symptoms. Additionally participants were excluded if they had a WTAR (Wechsler, 2001) estimated IQ < 70, to ensure informed consent and meaningful information could be obtained in the context of the clinical interview and neurocognitive tasks.

### 3.5.2.3 Participant contact and screening

The candidate contacted potential participants that had been referred from mental health services, responded to advertisements or had been identified through the additional recruitment sources by telephone or email. On first contact, individuals were provided with a brief overview of the project. To ascertain eligibility, interested participants were administered a basic telephone screen including a series of questions.
relating to the inclusion/exclusion criteria. Eligible participants were then sent copies of the Participant Informed Consent Form (see Appendix B) via email or mail at least 24 hours prior to the author following up with potential participants. At this time, interested and eligible participants were allocated a time for their first assessment session with the candidate.

3.5.3 Participants

Overall, 28 participants were referred to the study and screened for eligibility. Seven participants (25%) declined involvement and seven (25%) did not meet inclusion criteria due to reasons such as recent medication changes, meeting diagnostic criteria for a different psychotic disorder (e.g. bipolar disorder), not experiencing hearing voices within the last week or having an estimated premorbid IQ of < 70. Subsequently, 14 (50%) persistent voice hearers participated in the study. These recruitment figures appear to be in line with the large range reported by previous mindfulness for voices trials (e.g. Chadwick et al., 2009; 63% and Chadwick et al., 2016; 24%). Several reasons were given by the 7 participants who declined involvement in the study. For instance, some participants felt there were too many assessment sessions before and after the intervention, some wanted to be paid for the mindfulness sessions as well as the assessment sessions, and others were not interested in engaging in the program after being given information about what mindfulness practice involves. It is important to note that the information potential participants were given by the referrer about the study prior to being contacted by the candidate also varied greatly. Recruitment phase 1 included four participants and phase 2 comprised 10 participants. All participants had a diagnosis of schizophrenia (79%) or schizoaffective disorder (21%). Following the first mindfulness session, two participants dropped out of the study: one participant reported they preferred practicing a different form of meditation in which they detached from awareness of present moment experiences, and one participant only wanted to continue participation if paid for the therapy sessions in addition to research assessments (this was not part of the protocol or budget). It was concluded that in both cases this attrition was not due to difficulties with participation in the intervention.
3.5.4 Materials

3.5.4.1 Engagement

Home practice completion rates

The amount of time spent practicing mindfulness has been related to the cultivation of mindfulness skills and the level of improvement in psychological symptoms (Carmody & Baer, 2008). However, although home practice has been encouraged, engagement levels have not formally been recorded by previous studies. Given this, participants were asked to complete home practice records including which practices they completed during the week, the duration of their practice and any insights gained during the practice. This was filled out for both informal (e.g. mindfully washing your hands) and formal practices (body scan).

3.5.4.2 Participant feedback

Given this study was a feasibility pilot of the iMPV intervention, the candidate included a short qualitative interview in the post-assessment, in which participants were asked to provide feedback to assist with the program development process and access the acceptability of the program. Feedback items reported in Chapter 6 were thought to provide useful information regarding program acceptability, ‘do you think you are likely to continue with formal mindfulness practice?’ and ‘would you recommend mindfulness for other people who experience hearing voices?’. If participants endorsed yes to these dichotomous questions, further feedback was encouraged. Elaborative answers were chosen as examples in the qualitative section within Chapter 6. In addition to these items mentioned above, participants were asked the following questions: 1) ‘How likely are you to continue exploring the informal mindfulness practice we have done throughout the program, such as bringing awareness to a routine activity?’, 2) ‘What was your favourite aspect of the 4-week program?’, 3) ‘What was your least favourite or most difficult part of the program?’ 4) ‘How has the program helped you to relate differently to your voices?’ 5) ‘Is there any part of the program that you would change or run differently?’.
3.5.4.3 General assessment measures

**Demographic questionnaire**

Prior the initial assessment, participants were asked to complete a demographic questionnaire that included a range of items to obtain required demographic information. These included items yielding the following information: age, gender, clinical diagnosis, illness duration since diagnosis, and psychiatric medication usage (see Appendix C for a full list of demographic items).

**Wechsler Test of Adult Reading (WTAR)**

The WTAR was administered to participants as an estimate of premorbid IQ, with individuals receiving a score of < 70 being excluded from participation in the study. Further details pertaining to administration, scoring and psychometric properties of the WTAR can be found above in section 3.4.4.1.

3.5.4.4 Primary outcome

**Subjective Experience of Psychosis Scale (SEPS) – Negative impact of experience subscale**

The SEPS (Haddock et al., 2011) is a self-report measure of the impact of psychotic experiences in the last week. The 29 domains included in the SEPS were specifically identified as impacted upon by psychotic experiences by consumers with a diagnosis of a psychotic disorder and a lived experience of hearing voices (e.g. concentration; ability to socialise; levels of anxiety and stress). The negative impact of experience subscale was administered to participants with a specific instruction to rate the impact of hearing voices. Given MBIs are designed to alleviate distress and disruption associated with symptoms, rather than attempt to reduce the psychotic symptoms, the SEPS was chosen as the primary outcome measure as it is in line with these mindfulness principles. The negative impact of experience subscale has demonstrated excellent reliability, with a Cronbach’s $\alpha$ of 0.93 and a high test-retest coefficient of 0.83 (Haddock et al., 2011). Adequate convergent evidence for construct
validity has been supported by small-moderate correlations with the PANSS and PSYRATS scales of auditory hallucinations (Haddock et al., 2011).

3.5.4.5 Secondary outcomes

**Psychotic Symptoms Rating Scales (PSYRATS) – Auditory Hallucinations**

The PSYRATS (Haddock et al., 1999) was utilised to detect changes in voice-related distress and disruption. Additionally, total scores on the auditory hallucinations scale were used to determine the safety for the intervention with persistent voice-hearers, in the form of symptom deterioration. As seen by the results of the systematic search in study 1, the PSYRATS has been consistently used by previous research as an outcome measure in intervention trials for psychosis (e.g. Chadwick et al., 2016). Further information regarding the psychometric properties of the PSYRATS can be found above in section 3.4.4.2.

**Calgary Depression Scale for Schizophrenia (CDSS)**

The CDSS (Addington, Addington, & Maticka-Tyndale, 1993) is a clinician-rated measure that was designed to assess depression in individuals with schizophrenia, separate from positive and negative symptomatology. The CDSS was utilised in the current study rather than other commonly used measures of depression (e.g. BDI-II), as the candidate wanted to ensure outcomes of depressive symptoms were separated from common symptoms of psychosis. The CDSS has demonstrated good reliability with a Cronbach’s $\alpha$ of 0.79 and adequate convergent validity, as evidenced by high correlations with other measures of depression (e.g. BDI-II and the Hamilton Depression Scale; Addington, Addington, Maticka-Tyndale, & Joyce, 1992).

3.5.4.6 Process measures

**Mindfulness**

Previous literature has proposed that practicing state mindfulness through repeated formal meditation practices contributes to increased trait mindfulness over time (Kiken, Garland, Bluth, Palsson, & Gaylord, 2015). This is the premise behind mindfulness-based interventions that make use of experiential mindfulness practices
(Dudley et al., 2017). Given this, study 3 aimed to examine changes in the participants’ propensity to relate mindfully to experiences in their everyday lives (trait mindfulness; further defined above in section 3.4.4.4), as measured before and after the iMPV program.

Southampton Mindfulness Questionnaire (SMQ)

The SMQ (Chadwick et al., 2008) was utilised as a measure of participant’s usual responses to, and relationships with, distressing thoughts and images (degree of mindful relating). The SMQ has shown good reliability with a Cronbach’s $\alpha$ of 0.89 and construct validity, as evidenced by a strong correlation with the Mindfulness Acceptance and Action Scale ($r = 0.61$). Although study 2 used the SMVQ, a recent large-scale RCT evaluating a mindfulness intervention for voices (Chadwick et al., 2016) used the SMQ. Following conference with one of the researchers on this previous trial, the candidate decided it was important to maintain consistency with this trial to enable comparisons to this previously published outcome data. Despite this, the SMVQ was also given to participants as a measure of mindful responding to voices. Although results were not included in the manuscript of study 3, analyses revealed similar effects of the intervention on the SMVQ (Hedges’ $g = 0.68$, $p = .039$), to those reported for the SMQ.

Attention

Past research has identified impaired attentional control and switching in individuals who experience hearing voices (Siddi et al., 2017). It has been proposed this may result from attentional resources being allocated to the experience of hearing voices (Hugdahl, 2009). Previous literature has reported significant improvements in attention processes such as attentional control, attentional switching or set-shifting and sustained attention, following mindfulness training (Chambers et al., 2008; Jha et al., 2007; Tang et al., 2007). Given these findings and theoretical perspectives, this thesis aimed to examine whether changes in attention were mechanisms for observed outcomes following a mindfulness intervention for voices. To do so, study 3 administered several tasks measuring attentional switching or set-shifting and sustained
attention. The neurocognitive battery was administered using counterbalancing to reduce order effects and fatigue.

**Attentional switching**

*Delis-Kaplan Executive Function System (D-KEFS) - Color-Word Interference Test – switching condition*

The switching condition of the D-KEFS Color-Word Interference Test (Delis, Kaplan, & Kramer, 2001) was administered to participants to assess changes in attentional switching or set-shifting. In this condition, respondents are required to switch between naming the dissonant ink colour and reading the words (Delis et al., 2001; E. Strauss et al., 2006). The Color-Word Interference Test has shown moderate to adequate reliability with Cronbach’s $\alpha$ figures ranging from 0.70 - 0.79, and test-retest reliability, with a coefficient of 0.65 for the switching condition (Delis et al., 2001). It has also demonstrated good convergent evidence of construct validity, with an association with the California Verbal Learning Test – Second Edition (CVLT-II; Delis et al., 2001).

**Trail Making Test - Part B (TMT-B)**

Participants were administered the second component of the Trail Making Test, TMT-B (Reitan, 1992), as a measure of visual attention and cognitive switching. Practice effects on the TMT-B over several administrations have been noted by previous research (Wagner, Helmreich, Dahmen, Lieb, & Tadić, 2011). Given participants in recruitment phase 2 completed this task at four different time points, as little as one month apart, an alternate form for the test was used at time points 2 and 4. This form was developed by Wagner and colleagues (2006) and has demonstrated good reliability with the original form, with a Cronbach’s $\alpha$ of 0.86.

**Sustained attention**

*Continuous Performance Task – Identical Pairs Version (CPT-IP)*

The participants were given the CPT-IP (Riccio, Reynolds, Lowe, & Moore, 2002), a computer-based task, as a measure of selective and sustained attention. The
CPT-IP has demonstrated high test-retest reliability, with an intraclass correlation coefficient of 0.84 (Nuechterlein et al., 2008). This particular version of the CPT task was chosen, as it is included in the MATRICS Consensus Cognitive Battery, which was specifically designed to assess intervention outcomes in schizophrenia (E. Strauss et al., 2006).

3.5.5 Procedure

3.5.5.1 Assessment sessions

Following the telephone assessment of eligibility, interested participants were mailed the demographic and self-report questionnaires to complete prior to the first assessment session. Assessment and mindfulness sessions were conducted by the candidate (a clinically trained provisional psychologist), with the exception of the follow-up assessment sessions that were conducted by a research assistant trained in the administration of the clinician-rated and neurocognitive measures. All assessment sessions were conducted at either MAPrc or Swinburne University of Technology. At the first assessment session, participants were provided with a hard copy of the participant informed consent form, which included the aims, rationale and potential benefits and risks of the study, prior to written consent being obtained. Subsequently, the candidate administered the clinician-rated measures and neurocognitive tasks. The duration of each of the assessment sessions was approximately three hours. All participants were reimbursed $30 per assessment session to cover their time and travel costs.

As previously mentioned, the procedure for the two recruitment phases of the study differed in regard to the number of pre-intervention assessment sessions and the follow-up session. Participants recruited into the first phase completed assessment sessions at only two time points, before and after the intervention. However, participants recruited during the second phase completed assessment sessions at four time points: two pre-intervention time points one month apart (Time 0 and Time 1), as well as post-treatment (Time 2) and a follow-up two months later (Time 3).
3.5.5.2 Intervention

In addition to the assessment sessions, all participants took part in a four-week mindfulness intervention. Details of the development of this intervention will be discussed in the following section. Of note, in this section, the candidate is referred to as ‘the therapist’.

Development of the individual Mindfulness Program for Voices (iMPV)

The individual Mindfulness Program for Voices (iMPV) was developed by the candidate under the supervision of Associate Professor Neil Thomas as part of this PhD dissertation. The intervention was based on MBCT (Segal, Williams, & Teasdale, 2002) and MBSR (Kabat-Zinn, 1994) approaches and followed adaptations by Chadwick et al. (2005) and Thomas, Morris, Shawyer, and Farhall (2013) for individuals who hear voices. The intervention took place in conjunction with the Voices Clinic, Melbourne, Australia. All exercises utilised in the iMPV program had been used separate to the protocol with clients at the Voices Clinic prior to their inclusion to ensure that client feedback was attained.

The intervention entailed four weekly one-hour sessions with the therapist (see detailed descriptions of the four sessions below and in tabulated format in Table 1 of Chapter 6), a provisional psychologist who was level 1 trained in MBCT and had completed training in ACT for psychosis. Sessions were of individual format and included guided mindfulness practice alongside discussions around mindful responding as an alternative to habitual reactions to voices, non-judgemental awareness of voices and acceptance of symptoms and self. Home mindfulness practice between sessions was facilitated with audio files of guided mindfulness exercises on an MP3 device recorded by the therapist and a home practice record.

Session One - Current Coping and an Introduction to Mindfulness

The first session involved introducing the raisin exercise as a way of facilitating discussion around mindfulness as an alternative to automatic pilot. The therapist enquired in detail about the participants’ current relationships and engagement patterns with their voices, and the aims of the mindfulness intervention in relation to this.
Furthermore, the participants’ expectations for the intervention were discussed, and the importance of completing the home practice exercises was highlighted.

In regard to formal practice, a 15-minute guided body scan was used as a basic introduction for the participants to mindfulness practice. Participants were instructed to practice this body scan daily or as many times during the week as possible. Participants were asked to choose one daily activity and complete it ‘mindfully’, bringing moment-to-moment awareness to it, as part of their home practice. A home practice record was provided to participants to record this formal and informal practice, and any related comments or questions around these exercises. Participants completed this record throughout the duration of this four-session intervention.

Session two - Choiceless Awareness

Following a review of the home practice, a discussion around mindful awareness, and the idea of turning towards both pleasant and unpleasant sensations took place in the second session. The therapist enquired about the physical and emotional costs associated with participants’ habitual reactions to voices that were uncovered in session one and explored the importance of being patient and kind with oneself whilst learning new mindful ways of relating to this experience.

In respect to formal practice, a 3-minute breathing space was introduced on commencement of the second session, followed by a 5-minute mindful hearing exercise. This mindful hearing exercise was used to introduce the idea of practicing letting go of the categories normally used to make sense of what is being heard by the participant and to instead hear sounds as patterns of pitch, tone and volume. A 10-minute guided mindful stretching meditation was introduced, as a way of helping participants to bring their awareness back into their bodies. In addition to choosing a different daily mindful activity for the week, this mindful stretching exercise was completed by participants as a daily home practice.

Session three - Mindful Observation: Noting and Observing Voices

In the third session, following a review of the home practice, the therapist discussed with the participants the idea of mentally noting unpleasant thoughts; images
and voices during mindfulness practices and observing the experience pass or diminish. Additionally, discussions involved the idea of developing an awareness of habitual reactions to voices such as, struggling, fighting, avoiding, judging, worrying and ruminating and instead practicing letting go of these reactions. The therapist also discussed the differences between ‘letting go’ and avoidance, in relation to the concept of making a conscious choice to let go of a recognised reaction.

The first two sessions looked at mindfulness practice and the foundations that it is based on. However, in the third session mindfulness was practiced in respect to the experience of hearing voices. As it is often found that people’s voices are not as present or loud during the sessions, a guided 5-minute mindfulness of the breath exercise was practiced whilst listening to a dull and uninteresting speech. Following on from this exercise, the therapist and participant recorded specific voice content on a voice loop smartphone application that included similar themes to that of their voice hearing experience. This recording was played in the background while the participants completed a guided 10-minute mindfulness of the breath practice, with a focus on noting voices.

For home practice following this session, participants were asked to practice this 10-minute mindfulness of breath exercise daily, as well as a guided 3-minute breathing space with a focus on noting any experienced hearing of voices. They were instructed to implement this breathing space when they felt it was required. In addition to this formal practice, participants were asked to start attempting to mindfully respond to their experiences of hearing voices during the week. This informal home practice was implemented to help participants to start to generalise what they were learning during the intervention into their everyday lives.

Session four – Acceptance and Letting go of Habitual Reactions

In the fourth and final session of the intervention, the therapist fostered discussion with participants around turning awareness towards unpleasant psychotic sensations with a sense of curiosity for the experience. This involved a dialogue around starting to observe the tone, volume, frequency and location of a voice during the experience. It was discussed this observation supports developing a deeper awareness of
the experience and decreases the likelihood of getting lost in content and becoming consumed in old patterns of reacting. In addition, the therapist discussed the idea that automatic negative judgments of unpleasant psychotic experiences can often result in negative judgments about the self. Subsequently, a conversation was had around the primary aim of mindfulness to be promoting acceptance of all experience, as a foundation for a greater level of self-acceptance. Lastly, discussions around how participants can prepare for the future following this intervention included ideas around mindfulness being a way of life, rather than a short-term therapy. The therapist opened a dialogue with the participants about incorporating routine formal mindfulness practice and the importance of regularity of this practice for helping generalize this to their relationships with voices in everyday life.

Formal practices in the last session involved revisiting the guided 5-minute mindful hearing exercise, as well as completing a 10-minute mindfulness of the breath practice with the use of the specific voice content recording made in session three. This mindfulness of the breath practice encouraged the act of not only making a mental note of the experience of hearing voices, but also observing their form (tone, volume, frequency and location). The last formal practice completed in session four was the ‘stone exercise’: this involved a very similar structure to the raisin exercise undertaken in session one; however, participants were given the stone to take home with them as a symbol of their future mindfulness practice.

The home practice following this session was the same of that in session three: the 10-minute mindfulness of the breath meditation, with a focus on noting voices and observing their form; the 3-minute breathing space with a focus on voices, and further implementation of informal mindful responding to their experience of hearing voices.

*Intervention length*

Decisions regarding the number of sessions included in the iMPV program was based on several brief third wave interventions for psychosis outlined in previous literature (see Bach and Hayes, 2002; Gaudiano and Herbert, 2006; Langer et al., 2012; required level of attendance). Additionally, Associate Professor Neil Thomas’ experience of delivering the individual exercises utilised in the iMPV program within
The Voices Clinic in Melbourne, Australia suggested four sessions would be feasible with this client group. It was thought that a brief intervention was necessary to support engagement of an often ambivalent client group who we expected would show less uptake for a full 8 session program. Despite group programs such as MBCT and MBSR recommending a minimum of eight sessions, the candidate and her supervisory team felt this would be too long due to the following reasons: firstly, previous literature has identified that low-intensity interventions demonstrate good effects for psychosis more broadly (Hazell, Hayward, Cavanagh, & Strauss, 2016). Secondly, because the intervention was of individual format, the participants were able to receive an increased level of therapeutic attention further to that received in these group programs. Lastly, following participation in the MBCT training, the candidate also felt the iMPV program provided an adequate introduction to the concept of mindfulness and time for the participants to practice utilising these skills to relate differently to the experience of hearing voices.

The use of technology to overcome participant engagement barriers

As mentioned in further detail in Chapter 6, the iMPV program utilised several forms of technology to try and overcome participant’s difficulties engaging with home mindfulness practice and individualise the therapeutic content within sessions. The audio files of guided mindfulness practices that were installed on an MP3 player and given to participants were recorded by the therapist. This player was inexpensive ($14.00 per unit) and battery operated, with spare batteries provided to participants to
overcome any additional charging complications.

Given participants often report the specific content of their voices to be emotionally activating, a voice loop smartphone application was used to record participant’s specific voice content, that included similar themes to that of their voice hearing experience. This application made this process time efficient and easy to complete in collaboration with participants within the session. Lastly, to introduce participants to the practice of mindfully observing verbal dialogue, a portable speaker (UE Boom) connected to a smartphone used by the therapist, was used to play the ‘boring speech recording’, within session 3. This portable speaker was also utilised to play the mindful stretching practice recording (session 2), to enable the therapist to physically engage in this exercise with the participant, and the specific voice content recorded on the voice loop application, within sessions three and four.

3.5.6 Methodological Considerations

3.5.6.1 Ethical Clearance

Ethical approval to collect the data was approved by The Alfred Hospital and Swinburne University of Technology HRECS (see Appendix A). All procedures outlined in study 3 were conducted in line with this ethical clearance.

3.5.6.2 Funding

The candidate was awarded with a $5,000 grant from the Barbara Dicker Brain Sciences Foundation to conduct studies 1 and 3. This funding covered costs relating to participant reimbursement ($30 per assessment session; up to $120 per participant) and a research assistant to administer the follow-up assessments.

3.5.6.3 Statistical Analysis

All analyses were conducted on a per-protocol basis for the participants who completed the post-assessment (n = 12), to ensure sufficient therapeutic dose. Prior to analyses, assumption testing was conducted to assess the suitability of the data for using the $t$ distribution for paired samples and Wilcoxon Signed-Ranks tests (to derive significance levels for PSYRATS items). Following inspection of the frequency table, it
was found that a small percentage of data was missing from each of the variables (<5% per variable); cases were therefore excluded pairwise for all further statistical analyses. Kolmogorov–Smirnov normality tests revealed that the data met this assumption. Therefore, paired samples \( t \)-tests were used for all continuous data and Wilcoxon Signed-Ranks tests were used for all ordinal data. Given analyses were based on previous literature, the alpha level for all statistical analyses was set at .05. Given the small sample size of this study (< 20), standardised effect sizes were expressed as Hedge’s \( g_{av} \) (bias-adjusted standardised mean difference) for all change scores, as per recommendations (Lakens, 2013).

As a measure of potential symptom deterioration, the Reliable Change Index (RCI; Jacobson & Truax, 1991) was calculated for two participants whose PSYRATS Auditory Hallucination total scores were higher at post-intervention. The following formula was utilised, with baseline internal consistency used to index reliability:

\[
RCI = \frac{x_1 - x_2}{S_{diff}} \quad S_{diff} = \sqrt{2 \left(S_E\right)^2}
\]
CHAPTER 4: MINDFULNESS- AND ACCEPTANCE-BASED INTERVENTIONS FOR PSYCHOSIS: OUR CURRENT UNDERSTANDING AND A META-ANALYSIS
4.1 Preamble to Empirical Study 1

The first empirical study conducted as part of this thesis is presented within Chapter 4. As previously discussed within the literature review chapter (Chapter 2), previous meta-analyses have found small to moderate treatment effects for third-wave interventions on psychotic symptoms. However, these studies were limited by the small number of trials within the field at the time. Since the emergence of these previous meta-analyses, two large RCTs have been published. Therefore, the aim of study 1 was to conduct a comprehensive and up-to-date meta-analysis to establish the efficacy of third-wave approaches for psychosis.

This empirical paper has been published online (ahead of print) in Schizophrenia Research (a copy of the article in its published form is provided in Appendix D). This is an international multidisciplinary journal of the Schizophrenia International Research Society that disseminates scholarly research regarding the biology and treatment of schizophrenia spectrum disorders. The five-year impact factor for this journal is currently 4.337. The ‘Author Indication Form’, which details the nature and extent of the candidate and co-authors’ contributions to this empirical paper is included in Appendix E. The complete citation is as follows:

4.2 Mindfulness- and Acceptance-Based Interventions for Psychosis: Our Current Understanding and a Meta-analysis.

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Abstract

In promoting optimal recovery in persons with psychosis, psychological interventions have become a key element of treatment, with cognitive behavioural therapy being widely recommended in clinical practice guidelines. One key area of development has been the trialling of “third wave” cognitive behavioural interventions, which promote mindfulness, acceptance and compassion as means of change. Trials to date have demonstrated encouraging findings, with beneficial effects observed on measures of psychotic symptoms. This meta-analysis evaluated the efficacy of third wave interventions for the treatment of psychosis in randomised controlled trials, with psychotic symptoms as the primary outcome. Overall, 10 studies were included. The primary outcome demonstrated a small but significant effect ($g = 0.29$) for third wave interventions compared with control post-treatment. Trials of group format mindfulness-based interventions showed larger effects ($g = 0.46$) than individual acceptance and commitment therapy based interventions ($g = 0.08$), although methodological differences between trials were noted. Among secondary outcomes, a moderate, significant treatment effect ($g = 0.39$) was found for depressive symptoms, but no significant effects were found on specific measures of positive and negative symptoms, hallucination distress, or functioning/disability. A moderate effect on mindfulness ($g = 0.56$) was observed, but not on acceptance. Overall, findings indicate that third wave interventions show beneficial effects on symptoms in persons with psychotic disorders. However, further research is required to determine the efficacy of specific models of treatment.

Keywords: Psychosis, Schizophrenia, Mindfulness, Acceptance and Commitment Therapy, Meta-analysis.
CHAPTER 4: EMPIRICAL STUDY ONE

Introduction

As psychological therapies for psychosis have continued to evolve, one of the key developments has been to apply “third-wave” cognitive behavioural therapies (CBTp), with a focus on mindfulness and acceptance, to this population (Khoury et al., 2013b; Thomas et al., 2014a). Third-wave CBTp address one’s relationship with, and responses to, experiences and symptoms, rather than attempting to change them. These interventions are grounded in principles such as non-judgemental awareness, self-compassionate acceptance and defusion (Hayes, 2004a). They include mindfulness-based interventions (MBIs), acceptance-based approaches (e.g., Acceptance and Commitment Therapy, ACT), and compassion-based approaches (e.g., Compassion Focused Therapy, CFT). Mindfulness involves intentionally paying attention to present-moment experiences (including psychotic experiences) non-judgementally (Kabat-Zinn, 1994). This is typically cultivated through daily meditation practices and experiential exercises, via group-format courses (Strauss et al., 2015). ACT, a theoretically related but distinct psychotherapy approach, promotes acceptance of difficult experiences and defusion from patterns of thinking that dominate awareness, whilst committing to valued, meaningful activities (Hayes et al., 2006). Mindfulness exercises can feature in ACT, but are less central than in MBIs, with a wider repertoire of exercises and metaphors used, aiming to promote change in valued living. Compassion-based approaches foreground cultivating compassion towards self and others, given high levels of self-criticism associated with many mental disorders (Gilbert, 2009).

From a theoretical perspective, third-wave interventions that foreground non-judgemental and self-compassionate acceptance of experiences and symptoms would be expected to be of particular benefit to people with psychosis, given that unpleasant experiences and symptoms may be present in the longer term. Such therapies often use formal mindfulness practices or experiential exercises that focus on maintaining a ‘decentered awareness’ in the presence of internal psychotic experience (Chadwick et al., 2009). It has been suggested this process provides an alternate relationship with psychotic experience and decreases the likelihood of becoming consumed by unhelpful, habitual reactions (Abba et al., 2008; Chadwick et al., 2009). Furthermore, by observing psychotic symptoms, such as voices or delusional thoughts, with an open, non-
judgemental and curious awareness and without unhelpfully reacting, patients are better able to reclaim power over such experiences (Abba et al., 2008). Additionally, it has been suggested that acknowledgment and non-judgemental acceptance of psychotic symptoms facilitates an increased awareness of associated negative judgements about the self (Goodliffe et al., 2010) which third wave interventions might help to address by reducing attachment to negative self-beliefs. Furthermore, compassion-based approach may facilitate greater self-compassion as a means to reduce the impact of negative judgements about the self. Moreover, a focus in third wave approaches on the whole person rather than on symptoms is considered to be vital in re-establishing one’s identity beyond psychosis (Goodliffe et al., 2010).

In a meta-analysis of third-wave or mindfulness- and acceptance-based interventions for psychosis, Khoury and colleagues (2013b) reported a small-to-moderate treatment effect on positive symptoms from pre- to post-therapy (Hedge’s $g = 0.32$). Likewise, a recent meta-analysis of Cramer and colleagues (2016) identified moderate between-group treatment effects of mindfulness- and acceptance-based therapies on positive symptoms ($SMD = 0.57$). However, the number of studies available for both these previous meta-analyses was limited for examining between-group effects (≤ 8). Furthermore, analysis for between group differences on positive symptoms by Cramer and colleagues (2016) included only one mindfulness-based study. Since these recent meta-analyses a number of further trials have been published, including two large RCTs (Chadwick et al., 2016; Shawyer et al., 2016). Given these new trials, we conducted a comprehensive and up-to-date meta-analysis of RCTs, with an aim of determining the efficacy of these third-wave interventions for psychosis.

**Method**

**Eligibility Criteria**

Studies were selected meeting the following criteria: 1) randomised controlled trials, 2) the experimental treatment was a mindfulness-, acceptance- or compassion-based intervention for psychosis, 3) participants were adults diagnosed with a psychotic disorder, with >50% having a schizophrenia/schizoaffective disorder diagnosis, and 4) included quantitative measures of the primary or secondary outcomes. Both individual-
and group-format interventions were considered. We excluded studies that: 1) relied on self-reported symptomatology rather than diagnosis, 2) targeted participants with comorbid intellectual disability or substance dependence, 3) reanalysed data previously reported in another included study, or 4) were not published in peer-reviewed journals.

Information Sources

Literature searches were conducted using PsycINFO, MedLine and EMBASE, from the first available date until September 14th 2016. Additionally, reference lists of prior reviews and retrieved articles were manually searched.

The following terms were combined in keyword searches: mindfulness, meditation, acceptance. person-based cognitive therapy, compassion-focused, or compassionate mind; and schizophrenia, psychotic, psychosis, paranoia*, delusion*, hallucination*, distressing voices, voice hearing, or hearing voice*.

Data Collection Process and Data Items

Data were initially extracted by SL and checked by MF. The current analysis was limited to end-of-treatment data as few studies reported follow-up data, with varied time-points, and only included outcomes that could be aggregated from a minimum of three studies. Where both treatment-as-usual (TAU) and active control group data were reported, active control group data were used to compare with treatment group effects.

Risk of Bias in Individual Studies

The quality of studies was assessed using the Clinical Trial Assessment Measure (CTAM; Tarrier and Wykes, 2004), which has demonstrated adequate inter-rater reliability, internal consistency and concurrent validity in psychological intervention for psychosis trials (Tarrier and Wykes, 2004). Two authors (S.L. and M.F.) independently conducted quality ratings for the included studies, with discrepancies resolved by discussion.
Synthesis of Results

The primary outcome was the overall severity of psychotic symptoms. Secondary outcomes were positive and negative symptoms, hallucination-related distress, delusion-related distress, depressive symptoms, and functioning and disability. Process variables relating to mindfulness, acceptance and compassion were also considered. Supplementary analyses were conducted to determine the treatment effect on psychotic symptoms for theoretically defined contrasts: therapy model (mindfulness-based vs acceptance-based vs compassion-focused); individual vs group format; and comparison group (treatment-as-usual alone vs active control).

Study outcomes were expressed as Hedge’s $g$ (bias-adjusted standardised mean difference), which were calculated using end of treatment means and pooled standard deviations for treatment and control groups. Between-group effect size data were then synthesised using Comprehensive Meta-Analysis Version 3.0. A random effects model was used given expected differences between intervention protocols and study designs. Heterogeneity was tested using a $\chi^2$ test and the $I^2$ statistic calculated, with 25%, 50% and 75% representing low, moderate or high heterogeneity (Higgins et al., 2003). Publication bias was examined using both Rosenthal’s (1979) and Owin’s (1983) fail-safe $N$ (1979) methods.

Moderator Analyses

Meta-regression was planned to assess whether the primary outcome was affected by three continuous moderators: 1) study quality (CTAM score), 2) treatment duration in sessions, and 3) treatment duration in hours.

Results

Study Selection

A total of 836 potentially relevant studies were identified and screened for inclusion. After removing duplicates 735 studies remained and the first author screened their titles and abstracts. Following review, 699 studies were excluded that did not meet the inclusion criteria. A further 36 studies were selected for full-text evaluation.
(independently by SL and MF, with discrepancies resolved by NT); 22 did not meet inclusion criteria. Four studies required a more considered evaluation, and were subsequently excluded: 1) Bach and Hayes (2002) included rehospitalisation data only, which was not a pre-specified outcome, 2) Tyrberg and colleagues (2016) reported outcomes for rehospitalisation and values-based living, 3) Chadwick and colleagues (2009) reported change scores only and we were not able to obtain usable data from the authors, and 4) Gaudiano and colleagues (2015) included participants mostly diagnosed with Major Depressive Disorder with psychotic features. Overall, 10 eligible studies were included; see the PRISMA flow diagram in Figure 1 (see supplementary material for study characteristics; Braehler et al., 2013; Chadwick et al., 2016; Chien and Lee, 2013; Chien and Thompson, 2014; Gaudiano, 2006; Langer et al., 2012; López-Navarro et al., 2015; Shawyer et al., 2012; Shawyer et al., 2016; White et al., 2011).
Figure 1. PRISMA flow diagram.

Study Characteristics

The total sample included 624 participants, randomised to a third wave intervention (284) or a control condition (340). There was an average attrition rate of 9.15%. Included study intervention protocols comprised group-based MBI (5), individually administered ACT (4) and group-based CFT (1). Additionally, six of the included studies used a TAU or waitlist comparison, and four used an active control group: Psycho-education (Chien and Thompson, 2014), Integrated Rehabilitation Treatment (López-Navarro et al., 2015), or Befriending (Shawyer et al., 2012; Shawyer et al., 2016).
Risk of Bias within Studies

There was considerable variability in the methodological quality of studies (see supplementary material). Based on CTAM criteria, four studies were considered to have less than adequate methodological quality and considerable risk of bias (<65; Wykes et al., 2008).

Synthesis of Results

A summary of the results and the forest plots for the primary outcome and significant secondary analyses can be seen in Table 1 and Figure 2, respectively.

Primary outcome

The primary outcome analysis included studies that reported total psychotic symptom scores for the Positive and Negative Symptom Scale (PANSS; Kay et al., 1987), the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962), or the Clinical Global Impressions—Schizophrenia Scale (CGI-SCH; Haro et al., 2003). As seen in Table 1, analysis revealed a small, significant between-group post-intervention effect.

Planned sub-analyses for therapy protocol demonstrated a negligible and non-significant effect for studies using an (individual) ACT protocol, but a moderate and significant effect for (group-format) MBIs. When we considered effects on psychotic symptoms by the type of control group, a significant moderate effect was revealed when comparing intervention with TAU, but a small and non-significant effect was identified when contrasting with an active control group.
### Table 1. Summary of Meta-Analytic Results

<table>
<thead>
<tr>
<th>Analysis</th>
<th>N</th>
<th>Hedges’ g</th>
<th>95% CI</th>
<th>p (2-tailed)</th>
<th>Heterogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychotic Symptoms</td>
<td>8</td>
<td>0.29*</td>
<td>[0.04, 0.54]</td>
<td>.021</td>
<td>11.118 (7) 37.04</td>
</tr>
<tr>
<td>Positive Symptoms</td>
<td>4</td>
<td>-0.10</td>
<td>[-0.38, 0.18]</td>
<td>.472</td>
<td>2.811 (3) 0.00</td>
</tr>
<tr>
<td>Negative Symptoms</td>
<td>4</td>
<td>0.09</td>
<td>[-0.22, 0.40]</td>
<td>.561</td>
<td>3.572 (3) 16.02</td>
</tr>
<tr>
<td>Hallucination-Related Distress (Intensity)</td>
<td>3</td>
<td>-0.07</td>
<td>[-0.37, 0.23]</td>
<td>.647</td>
<td>2.261 (2) 11.53</td>
</tr>
<tr>
<td>Hallucination-Related Distress (Amount)</td>
<td>3</td>
<td>-0.07</td>
<td>[-0.35, 0.21]</td>
<td>.636</td>
<td>1.919 (2) 0.00</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>3</td>
<td>0.39*</td>
<td>[0.09, 0.69]</td>
<td>.011</td>
<td>0.535 (2) 0.00</td>
</tr>
<tr>
<td>Functioning and Disability</td>
<td>5</td>
<td>0.09</td>
<td>[-0.23, 0.42]</td>
<td>.567</td>
<td>8.377 (4)* 2.25</td>
</tr>
<tr>
<td>Mindful Awareness</td>
<td>4</td>
<td>0.56**</td>
<td>[0.15, 0.97]</td>
<td>.007</td>
<td>4.957 (3) 9.48</td>
</tr>
<tr>
<td>Acceptance</td>
<td>3</td>
<td>0.08</td>
<td>[-0.44, 0.60]</td>
<td>.756</td>
<td>3.781 (2) 47.10</td>
</tr>
<tr>
<td><strong>Treatment Protocol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance (individual format)</td>
<td>4</td>
<td>0.08</td>
<td>[-0.23, 0.38]</td>
<td>.630</td>
<td>4.231 (3) 29.09</td>
</tr>
<tr>
<td>Mindfulness (group format)</td>
<td>4</td>
<td>0.46***</td>
<td>[0.18, 0.75]</td>
<td>.001</td>
<td>2.721 (3) 0.00</td>
</tr>
<tr>
<td><strong>Control Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAU/Waitlist</td>
<td>4</td>
<td>0.46*</td>
<td>[0.09, 0.82]</td>
<td>.015</td>
<td>0.510 (3) 0.00</td>
</tr>
<tr>
<td>Active Control</td>
<td>4</td>
<td>0.16</td>
<td>[-0.17, 0.49]</td>
<td>.339</td>
<td>8.603 (3)* 65.13</td>
</tr>
</tbody>
</table>

*Note.* N = number of studies, †p <.10, *p <.05, **p <.01, ***p <.001.
Figure 2. Forest plots for primary outcome and significant secondary analyses

### Effect of Mindfulness on Psychotic Symptoms

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Study Name</th>
<th>Hedge's g</th>
<th>Standard error</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Z-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychotic symptoms</td>
<td>Lange et al. (2012)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>Shewan et al. (2013)</td>
<td>0.12</td>
<td>0.12</td>
<td>-0.17</td>
<td>0.41</td>
<td>1.23</td>
<td>0.22</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>White et al. (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>Zhao &amp; Li (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Psychotic symptoms</td>
<td>Zia &amp; Winstanley (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Meta Analysis

### Effect of Mindfulness on Psychotic Symptoms by Treatment Protocol

<table>
<thead>
<tr>
<th>Group by Protocol</th>
<th>Outcomes</th>
<th>Study Name</th>
<th>Hedge's g</th>
<th>Standard error</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Z-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Mindfulness</td>
<td>Psychotic symptoms</td>
<td>Lange et al. (2012)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Adult Mindfulness</td>
<td>Psychotic symptoms</td>
<td>White et al. (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Adult Mindfulness</td>
<td>Psychotic symptoms</td>
<td>Zhao &amp; Li (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Adult Mindfulness</td>
<td>Psychotic symptoms</td>
<td>Zia &amp; Winstanley (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Meta Analysis

### Effect of Mindfulness on Psychotic Symptoms by Control Group

<table>
<thead>
<tr>
<th>Group by Control Group</th>
<th>Outcomes</th>
<th>Study Name</th>
<th>Hedge's g</th>
<th>Standard error</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Z-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Control</td>
<td>Psychotic symptoms</td>
<td>Shewan et al. (2013)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Active Control</td>
<td>Psychotic symptoms</td>
<td>Zhao &amp; Li (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Active Control</td>
<td>Psychotic symptoms</td>
<td>Zia &amp; Winstanley (2015)</td>
<td>0.15</td>
<td>0.14</td>
<td>-0.01</td>
<td>0.31</td>
<td>1.22</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Meta Analysis
Secondary outcomes

Studies included in the analyses for positive and negative symptoms reported scores from the PANSS positive and negative scales. The analysis of hallucination distress used the hallucination distress-intensity and distress-amount item scores from the Psychotic Symptom Rating Scales (PSYRATS; Haddock et al., 1999). There were insufficient studies reporting delusion-related distress. Depression measures used included the Beck Depression Inventory—II (BDI-II; Beck et al., 1996) and the depression scale of the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). Functioning and disability measures included the Specific Level of Functioning Scale (SLOF; Schneider and Struening, 1983), Modified Global Assessment of Functioning (mGAF) scale (Hall, 1995), Social Functioning Scale (SFS; Birchwood et al., 1990) and the Sheehan Disability Scale (SDS; Leon et al., 1997). Among the secondary outcomes we observed a moderate and significant between-group post-intervention effect on depressive symptoms, but no significant effects on positive or negative symptoms, hallucination-related distress (intensity or amount), or functioning and disability.
Process measures

Mindfulness measures included the Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008), the Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003) and the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004). Measures of acceptance included two versions of the Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011; AAQ-16; Hayes et al., 2004b). Insufficient studies reported on compassion for analysis. The analyses demonstrated a moderate and significant between-group post-intervention effect on mindfulness, but only a negligible treatment effect for acceptance that did not reach significance.

Heterogeneity

Given the small number of studies in each analysis (3-8), p value of < .10 was used to determine statistical significance for the $\chi^2$ test (Higgins and Green, 2011). Low heterogeneity was observed for the primary analysis. Significant heterogeneity was found only for the sub-analysis of overall psychotic symptom effects in trials with active comparison conditions (moderate heterogeneity), and the secondary analysis of the treatment effect on functioning and disability (moderate heterogeneity).

Publication Bias

Using Rosenthal’s (1979) *fail-safe N* publication bias method results indicated that 11 studies with null findings would be required to nullify the observed pooled treatment effect of the primary outcome. Similarly, Owin’s *fail-safe N* method revealed that 37 studies with a mean Hedges’ $g$ of zero would be required to render the pooled treatment effect of the primary outcome ‘trivial’ in size (0.05; Orwin, 1983). Given the number of studies identified for inclusion, it is considered unlikely that 37 unpublished RCTs of third-wave interventions for psychosis exist.

Moderator Analysis

A random effects meta-regression using CTAM score as a continuous moderator on the pooled effect size of the primary outcome revealed the moderation of trial quality was not significant ($B = -0.014$, SE = 0.0084, 95% CI = -0.0302, 0.0027, $p = 0.103$).
Additionally, psychotic symptom severity post-treatment was not significantly moderated by the number of treatment sessions ($B = -0.0345$, SE = 0.0237, 95% CI = -0.0809, 0.0118, $p = .144$). There was a trend towards psychotic symptom severity post-treatment being moderated by treatment duration in hours ($B = 0.0284$, SE = 0.0157, 95% CI = -0.0023, 0.0590, $p = .070$), with longer interventions showing larger effects.

**Discussion**

Ten studies of third-wave interventions for psychosis comprising 624 participants were included in this meta-analysis. Results suggest these interventions are efficacious for reducing overall psychotic symptoms, with a significant small-to-moderate between-group post-intervention effect identified. This effect size is of similar magnitude to effects reported in meta-analyses of CBTp (Jauhar et al., 2014; Wykes et al., 2008), the main established psychological intervention approach for psychosis. Effects on psychotic symptoms were not moderated by study quality or treatment duration; however, the meta-regression analysis was underpowered and caution should be taken when interpreting these findings. Overall, effect sizes were much smaller and were no longer significant when examining studies comparing treatment with an active control group. High levels of heterogeneity were observed in this analysis, which may reflect differences arising from the varied intervention protocols, control protocols and other methodological characteristics of these trials. Indeed, it is notable that effects were smallest in trials comparing with befriending as a comparison condition (Shawyer et al., 2012; Shawyer et al., 2016), which raises the possibility that much simpler interventions may be equally effective in improving psychosis outcomes. Hence, overall, at this stage we cannot conclude that it is the specific components of third-wave interventions that contribute to effects, but addition of therapies to routine care appear efficacious in improving outcomes.

When studies were grouped by treatment protocol, the observed effect on psychotic symptoms appeared specific to the interventions that involved MBIs, with ACT trials showing negligible, non-significant treatment effects. It should be noted that there was some interaction with trial methodology, with three of the four ACT trials involving comparison with active controls. Nonetheless this raises the possibility that
ACT may be relatively less effective than focused mindfulness interventions in promoting effective change in individuals with psychosis. This would be consistent with our observations of change on measures of mindfulness but not of acceptance. Considering cognitive challenges in this population, it is feasible that the more structured and focused approach of mindfulness courses performed better, and/or that the complexity of different components of ACT, and the use of metaphors and abstract experiential exercises were more challenging. This would be consistent with qualitative feedback from some participants in one of the included ACT trials (Bacon et al., 2014). MBI trials also differed by involving group delivery, whilst ACT involved individual therapy. No studies examining the effects of a MBI for psychosis in individual format were identified during the study selection process. Given psychological interventions are most frequently delivered on an individual basis there is a key need to examine this delivery modality.

We also observed positive effects on depressive symptoms in individuals with psychosis, with moderate and significant effects observed. This is consistent with meta-analyses of mindfulness for depression in community samples (Khoury et al., 2013a), and is important given the prevalence of depressive symptoms in persons with persisting and recurrent psychosis, and their implications for quality of life.

On the other hand, analyses found no significant positive between-group post-intervention effects for positive and negative symptoms, hallucination-related distress, and functioning and disability. It should be noted that data for positive and negative symptoms were only available for four studies, all using the PANSS, three of which (López-Navarro et al., 2015; Shawyer et al., 2012; Shawyer et al., 2016) showed low effects across all measures. However, the absence of findings for more specific measures of psychotic symptoms might suggest that the impacts of third-wave intervention reflect effects on general symptoms such as depression rather than on psychotic symptoms per se.

It should be borne in mind that overall symptom severity measures provide relatively indirect measures of the intended outcomes of psychological interventions, rather than the more specific therapeutic goals of reduced symptom-related distress or
improved functioning (Thomas, 2015a). Our chosen primary outcome provided a pragmatic means of pooling data from a number of trials. However, a limitation here is that third-wave interventions are clearly founded on the premise that distress results from ones responses to difficult experiences, rather than the experiences themselves (Hayes et al., 2006; Kabat-Zinn, 1994). Consequently, MBIs are designed to alleviate symptom related distress rather than reduce psychotic symptomatology. Hence estimates of the magnitude of effect from this meta-analysis should be considered only an indirect index of efficacy. Even on the PSYRATS items that more directly index symptom-related distress, large clinical changes are required to show improvements (Thomas et al., 2014). It should be noted that the largest CBTp study reporting on hallucination-related distress also failed to find an effect on this measure (Birchwood et al., 2014), raising the possibility of measure insensitivity. This highlights a need to develop and validate more appropriate outcome measures: Ones, which assess the emotional and functioning impact of psychotic experiences, are in line with third-wave aims, and advocated by the recovery movement. Such efforts to do so are currently underway (e.g., the Voice Impact Scale; Strauss, 2016).

**Conclusion**

In sum, findings from RCTs indicate third-wave interventions are efficacious for the treatment of psychotic symptoms, and for the treatment of depressive symptoms in the context of psychosis. Significant between-group post-intervention differences on mindfulness are consistent with the suggestion that improved mindfulness is a potential mechanism of observed symptom change. Further RCTs using appropriate outcome measures are needed to further determine the effectiveness of third-wave interventions on the emotional and functioning impact of psychotic experiences.
## Supplementary Data. Characteristics of Studies Included in the Meta-Analysis

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants (N)</th>
<th>M age</th>
<th>% male</th>
<th>Treatment group</th>
<th>Comparison group(s)</th>
<th>Session format</th>
<th>Treatment time (hours)</th>
<th>Attrition %</th>
<th>F/U (months)</th>
<th>Selected outcome measure(s)</th>
<th>Selected process measure(s)</th>
<th>CTAM quality score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brasilier et al. (2013)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia Spectrum Disorder or Bipolar Disorder with psychotic features (40)</td>
<td>41.6</td>
<td>55</td>
<td>CFT (22)</td>
<td>TAU (18)</td>
<td>Group</td>
<td>32.0</td>
<td>18.0</td>
<td>-</td>
<td>BDI-II</td>
<td>-</td>
<td>64</td>
</tr>
<tr>
<td>Chadwick et al. (2016)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia or schizoaffective disorder and currently hearing voices (108)</td>
<td>42.0 (Md)</td>
<td>50</td>
<td>PBCT (54)</td>
<td>TAU (54)</td>
<td>Group</td>
<td>18.0</td>
<td>13.8</td>
<td>10</td>
<td>PEYRATS HADS</td>
<td>SMQ</td>
<td>75</td>
</tr>
<tr>
<td>Chien &amp; Lee (2013)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia with an illness duration of less than 5 years (90)</td>
<td>25.9</td>
<td>55</td>
<td>Mindfulness-Based PsychEd Program + TAU (45)</td>
<td>TAU (51)</td>
<td>Group</td>
<td>24.0</td>
<td>6.0</td>
<td>-</td>
<td>BPRS SLOF</td>
<td>-</td>
<td>66</td>
</tr>
<tr>
<td>Chien &amp; Thompson (2014)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia with an illness duration of less than 5 years (107)</td>
<td>25.6</td>
<td>57</td>
<td>Mindfulness-Based PsychEd Program + TAU (36)</td>
<td>TAU (35) Conventional PsychEd + TAU(36)</td>
<td>Group</td>
<td>24.0</td>
<td>6.5</td>
<td>6</td>
<td>BPRS SLOF</td>
<td>-</td>
<td>79</td>
</tr>
<tr>
<td>Gaudiano &amp; Herbert (2006)</td>
<td>Inpatients meeting diagnostic criteria for Affective (42%) &amp; Non-affective (58%) Psychotic Disorders (40)</td>
<td>40.0</td>
<td>64</td>
<td>ACT + ETAU (19)</td>
<td>ETAU (21)</td>
<td>Individual</td>
<td>4.0</td>
<td>2.5</td>
<td>4</td>
<td>BPRS SDS</td>
<td>-</td>
<td>53</td>
</tr>
<tr>
<td>Langer et al. (2012)</td>
<td>Outpatients meeting diagnostic criteria for a Schizophrenia Spectrum Disorder (23)</td>
<td>34.3</td>
<td>57</td>
<td>MBCT (11)</td>
<td>Waitlist (12)</td>
<td>Group</td>
<td>8.0</td>
<td>8.6</td>
<td>-</td>
<td>CGI-SCH</td>
<td>AAQ-II, SMQ</td>
<td>55</td>
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<tr>
<td>Lopez-Navaarro et al. (2015)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia, Schizoaffective Disorder or Bipolar Disorder with psychotic features (44)</td>
<td>38.8</td>
<td>82</td>
<td>IRT + MBI (22)</td>
<td>IRT (22)</td>
<td>Group</td>
<td>26.0</td>
<td>6.75</td>
<td>-</td>
<td>PANSS</td>
<td>MAAS</td>
<td>68</td>
</tr>
<tr>
<td>Shawyer et al., (2012)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia and currently hearing command hallucinations (45)</td>
<td>39.0</td>
<td>56</td>
<td>TORCH + TAU (49)</td>
<td>Waitlist (17) Befriending (14)</td>
<td>Individual</td>
<td>12.5 + 1.6 during follow-up period</td>
<td>6.9</td>
<td>6</td>
<td>PANSS mGAF PSYRATS</td>
<td>-</td>
<td>87</td>
</tr>
<tr>
<td>Shawyer et al. (2016)</td>
<td>Outpatients meeting diagnostic criteria for Schizophrenia or Schizoaffective Disorder (96)</td>
<td>36.1</td>
<td>62</td>
<td>ACT + TAU (49)</td>
<td>Befriending (47)</td>
<td>Individual</td>
<td>6.5</td>
<td>11.4</td>
<td>6</td>
<td>PANSS PSYRATS SFS</td>
<td>AAQ-16</td>
<td>87</td>
</tr>
<tr>
<td>White et al., (2011)</td>
<td>Outpatients meeting diagnostic criteria for Affective &amp; Non-affective Psychotic Disorder (27)</td>
<td>34.0</td>
<td>78</td>
<td>ACT + TAU (14)</td>
<td>TAU (13)</td>
<td>Individual</td>
<td>10.0</td>
<td>11.0</td>
<td>-</td>
<td>HADS PANSS</td>
<td>AAQ-II, KIMS</td>
<td>64</td>
</tr>
</tbody>
</table>

Note. M age = mean age; Tx time = treatment time; Att = attrition; F/U = follow-up; CTAM = Clinical Trial Assessment Measure; ACT = acceptance and commitment therapy; TAU = treatment as usual; CFT = compassion focussed therapy; BDI-II = beck depression inventory - II; MBI = mindfulness-based intervention; PSYRATS = psychotic symptom rating scales; Md = median; PBCT = Person-based Cognitive Therapy; HADS = hospital anxiety and depression scale; SMQ = Southamton mindfulness questionnaire; PsychEd = psychoeducation; SLOF = specific levels of functioning scale; ETAU = enhanced treatment as usual; SDS = sheehan disability scale; MBCT = mindfulness-based cognitive therapy; CGI-SCH = clinical global impression-schizophrenia scale; AAQ-II = acceptance and action questionnaire – II; IRT = integrated rehabilitation treatment; PANSS = positive and negative symptom scale; MAAS = mindfulness attention awareness scale; TORCH = treatment of resistant command hallucinations; mGAF = modified global assessment of functioning scale; AAQ-16 = Acceptance and Action Questionnaire – 16 item; SFS = social functioning scale; KIMS = Kentucky inventory of mindfulness skills.
CHAPTER 4: EMPIRICAL STUDY ONE

References


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Thomas, N., 2014. What have we learnt about how to capture and measure the outcomes of psychological therapies for voices? in: Hayward, M., Strauss, C., McCarthy-Jones, S. (Eds.), Psychological approaches to understanding and


CHAPTER 5: DOES MINDFULNESS HELP PEOPLE ADAPT TO THE EXPERIENCE OF HEARING VOICES?
5.1 Preamble to Empirical Study 2

Chapter 5 comprises the second original research study conducted as part of this dissertation. The meta-analytic findings presented in Chapter 4 indicated third-wave approaches to be effective overall for the treatment of psychotic symptoms and depressive symptoms, in the context of psychosis. Findings appeared strongest for mindfulness-based interventions, with changes demonstrated on measures of mindfulness, and mindfulness-based protocols having clearest efficacy. This empirical study aimed to further consider the role of mindfulness in adjusting to hearing persisting voices by investigating whether individual differences in mindful relating to voices showed predicted associations with indices of adaptation to the experience. Specifically, it examined whether mindfulness predicted reduced negative impacts of the experience such as voice-related distress and disruption, and resistant responding.

This empirical paper is currently under review with Psychiatry Research. This is an international multidisciplinary journal that disseminates scholarly research relating to the determinants and assessment of human behaviour and the evaluation of psychiatric treatments. The five-year impact factor for this journal is 2.837. The ‘Author Indication Form’, which details the nature and extent of the candidate and co-authors’ contributions to this empirical paper is included in Appendix F. The complete citation is as follows:

5.2 Does mindfulness help people adapt to the experience of hearing voices?

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Abstract

Mindfulness-based interventions show promise in the treatment of psychotic symptoms. From a theoretical perspective, there may be several benefits of mindfulness for individuals who experience hearing voices. Related cross-sectional findings suggest mindfulness may protect against distress, disruption, negative beliefs, dysfunctional relational style and responding, and mood symptoms for individuals who hear voices. To extend on previous findings, this study aimed to identify whether mindful relating to voices predicted voice-related negative impacts (distress, disruption and resistance), when the influence of voice-topography and mood symptoms were controlled for. Overall, 62 participants with a psychotic disorder who had experienced hearing voices in the previous week were given the Southampton Mindfulness of Voices Questionnaire, Psychotic Symptom Rating Scales, Beliefs About Voices Questionnaire, Beck Depression Inventory-II, and Beck Anxiety Inventory. As predicted, greater mindfulness of voices predicted less voice-related distress and lower resistance to voices. Regression analyses revealed that when associated voice topography and mood symptoms were controlled for, mindful relating to voices explained a significant proportion of variance in voice-related distress and resistance. Conversely, mindfulness of voices did not significantly predict voice-related disruption. In the context of existing literature, these findings suggest further mindfulness-based protocols for persistent voices should be developed and trialled.

Keywords: mindfulness, psychosis, auditory verbal hallucinations, voices, distress, depression, anxiety.
CHAPTER 5: EMPIRICAL STUDY TWO

Introduction

The occurrence of persisting positive symptoms, such as auditory verbal hallucinations (or ‘voices’) and delusions is most prominent in schizophrenia spectrum disorders, with up to 80% reporting the experience of such symptoms (Andreasen & Flaum, 1991). However, prevalence of positive psychotic symptoms, such as voices, have also been reported in affective disorders such as bipolar disorder and major depressive disorder, albeit at lower rates (Toh, Thomas, & Rossell, 2015). Furthermore, many individuals continue to experience these positive psychotic symptoms, despite the use of antipsychotic medication (Elkis, 2007; Hegarty, Baldessarini, Tohen, Waternaux, & Oepen, 1994). These persisting positive symptoms of psychosis have been found to be a strong predictor of rehospitalisation rates, distress, depression and anxiety (Smith et al., 2006; Sota, 2000). These findings highlight the importance for psychological therapies to target these refractory symptoms (Burns, Erickson, & Brenner, 2014).

The application of mindfulness-based therapies to help people with persisting psychotic symptoms, has been one of the most prominent recent therapeutic developments in this field (Thomas, Hayward, Peters, et al., 2014). Mindfulness involves paying attention to present-moment experiences, such as internal psychotic experiences, purposely and non-judgementally (Kabat-Zinn, 1994). It has been suggested the cultivation of mindful awareness helps individuals develop an alternate relationship with psychotic symptoms and lessens the likelihood of becoming preoccupied by ineffective habitual reactions, such as struggle or engagement (Abba, Chadwick, & Stevenson, 2008).

A recent meta-analysis by Louise, Fitzpatrick, Strauss, Rossell, and Thomas (2017) found moderate treatment effects of group format mindfulness-based interventions on psychotic symptoms (Hedge’s $g = 0.46$), compared with control post-treatment. However, despite the existence of several randomised control trials (RCTs) of mindfulness interventions for psychosis in extant literature (Chadwick et al., 2016; Chien & Lee, 2013; Chien & Thompson, 2014; Langer, Cangas, Salcedo, & Fuentes, 2012; López-Navarro et al., 2015), only one of these trials considered outcomes on persistent voices (Chadwick et al., 2016). Chadwick and colleagues (2016) identified
significant between group post-intervention effects on negative voice impacts, such as voice-related distress and perceived controllability, following a course of Person-Based Cognitive Therapy (PBCT), incorporating cognitive therapy and mindfulness.

A recent review by Strauss, Thomas, and Hayward (2015) proposed several theoretical reasons why mindfulness might be of particular benefit for individuals experiencing persistent voices. Specifically, i) mindful observation may protect against preoccupation with verbal engagement with voices, ii) acceptance presents an alternative to experiential avoidance or suppression that may maintain voices and related distress, iii) a decentered awareness may reduce the impact of negative voice-content and self-beliefs on distress, and iv) targeting of control behaviours, such as rumination and worry, often experienced with voice hearing that may maintain this experience and/or associated distress.

If mindfulness is helpful as a therapeutic mechanism in adapting to persisting voices, it would be expected that individual differences in trait mindfulness would predict lower negative voice impacts, such as distress, disruption, and negative responses to voices. These dimensions are a common target of psychological therapies, and as such, numerous studies have confirmed that beliefs targeted in cognitive therapy (i.e. that voices are malevolent and powerful) predict distress and responding to voices with attempts to resist them (Hayward, Berry, & Ashton, 2011). However, few studies to date have looked at how individual differences in mindfulness may predict these voice impacts. Chadwick, Barnbrook, and Newman-Taylor (2007) found that mindful relating to voices was associated with lower negative affect, voice-related distress and resistance to voices. Morris, Garety, and Peters (2014) found non-judgemental acceptance was associated with lower resistance of voices and improved mood (depression and anxiety). Conversely, no significant associations were found between non-judgemental acceptance and voice-related distress and disruption. Similarly, regression analysis identified non-judgemental acceptance to significantly predict resistance to voices, but not mood symptoms or voice-related distress or disruption. However, these findings are restricted by the fact that Morris and colleagues (2014) did not explore the impact of other trait mindfulness characteristics, such as mindful observation and awareness, due to methodological limitations.
Additionally, Úbeda-Gómez et al. (2015) found that mindfulness was negatively correlated with voice-related distress and dissociative symptoms. More recently, Perona-Garcelán, Rodriguez-Testal, Senín-Calderón, Ruiz-Veguilla, and Hayward (2016) found that mindfulness predicted lower mood symptoms and mediated an observed association between dysfunctional relational style and mood.

These findings suggest there is preliminary evidence that trait mindfulness may be associated with better adaptation to the experience of hearing voices. However, findings for voice-related impacts are somewhat inconsistent in relation to distress (Chadwick et al., 2007; Morris et al., 2014). Additionally, most of these studies looked at mindfulness as a general trait measure, rather than specifically at an individual’s ability to relate mindfully to their voices (Morris et al., 2014; Perona-Garcelán et al., 2016; Úbeda-Gómez et al., 2015). Chadwick and colleagues’ (2007) study that did look at mindfulness of voices was limited by the inclusion of an unvalidated rating of voice-related distress, and use of the resistance scale of the Beliefs About Voices Questionnaire–Revised (BAVQ-R). This scale indexes a combination of both behavioural and emotional responses to voices, resulting in the inclusion of items of voice-related emotional distress.

Furthermore, cross-sectional studies to date have not controlled for the effects of voice topography and overall distress (depression and anxiety) on voice-related negative impacts. Given measures of voice-related distress may be influenced by overall mood symptoms, and by voice frequency, duration and intensity, these variables are important to consider as confounds in examining the relationship between processes such as mindfulness and the impact of voices (Soppitt & Birchwood, 1997).

**Research aims and hypotheses**

The present study explored the relationships between mindful relating to voices, voice-related negative impacts (distress, disruption and resistant responding), voice topography and mood (depression and anxiety). This study aimed to identify whether mindful relating to voices predicted voice-related negative impacts, when the influence of voice topography and mood symptoms were controlled for. It was predicted that when confounding voice topography and mood symptoms were controlled for, a
significant amount of variance in voice-related distress, disruption and resistance would be explained by trait-based mindful responding to voices.

Method

Participants

In total, 62 participants were recruited from inpatient and outpatient mental health services, a specialist Voices Clinic in Melbourne, Australia, and online and print advertisements. Inclusion criteria were: 1) a previous diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, or major depressive disorder, 2) over 18 years of age, and 3) experienced hearing voices within the last week. Exclusion criteria were: 1) history of neurological disorder, 2) electroconvulsive therapy in the past six months, 3) a current substance dependence disorder, or 4) a Wechsler Test of Adult Reading (WTAR; Wechsler, 2001) estimated IQ < 70, to ensure informed consent and meaningful information in the context of the clinical interview could be provided. Participants provided written informed consent in accordance with approved ethical requirements and the Declaration of Helsinki (World Medical Association, 2008) and were financially reimbursed for their time and travel costs.

Design and procedure

This study used a cross-sectional design, with all demographic information and clinical measures completed at one time point. Following a basic telephone screen for eligibility, participants completed a demographic questionnaire and self-report measures. Subsequently, one of two trained researchers administered the clinician-rated measures. These measures were administered over one or two sessions within a one week period.

Measures

Psychotic Symptoms Rating Scales – Auditory Hallucinations (PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999)

A measure of the specific characteristics of auditory hallucinations, consisting of 11 items assessing: frequency, duration, location, loudness, beliefs about origin, amount
and degree of negative content, amount and intensity of distress, disruption and control. Items are rated on 5-point (0 to 4) anchored interviewer-rated scales, with higher scores indicating greater severity. The scale was administered to patients to obtain specific information about voice-related distress, disruption and voice topography (frequency, duration, loudness).

Beliefs About Voices Questionnaire – Revised (BAVQ-R; Chadwick, Lees, & Birchwood, 2000)

A 35-item measure of people’s beliefs about auditory verbal hallucinations and their emotional and behavioural relationship with these voices. Items are scored on a 4-point scale (0 disagree to 3 strongly agree), and summed to create five subscale scores: three relating to beliefs about voices (malevolence, benevolence and omnipotence) and two relating to reactions to voices (engagement and resistance). The resistance subscale, which was used as an index of negative responses to voices, consists of both behavioural and emotional items. Previous studies have often reported these as a single resistance scale; however, these behavioural and emotional items can also be considered separately.

Beck Depression Inventory–II (BDI - II; Beck, Steer, & Brown, 1996)

A 21-item self-report measure of intensity of depressive symptomatology. Items are consistent with DSM-IV criteria, and scored on a 0-3 scale with anchored descriptors. Item scores are then summed to create a total score ranging from 0-63, with higher scores indicating more severe depressive symptoms.

Beck Anxiety Inventory (BAI; Beck & Steer, 1990)

The BAI is a 21-item self-report measure of anxiety symptom severity. Items are scored on a 0–3 scale, and then summed to generate a total score ranging from 0-63, with higher scores indicating more severe anxious symptomatology.
Southampton Mindfulness of Voices Questionnaire (SMVQ; Chadwick et al., 2007)

The SMVQ assesses the degree to which individuals mindfully respond to the experience of hearing voices. The questionnaire is thought to tap into the four key concepts of mindfulness: awareness, turning towards unpleasant experiences in comparison with experiential avoidance, non-judgemental acceptance and letting go. The SMVQ comprises 12 items, and responses are scored on a 7-point strongly disagree to strongly agree Likert scales, with six items keyed positively and six negatively. Item scores are summed to create a total score with a theoretical range of 0 to 72, with higher scores reflecting a greater degree of mindful responding to voices.

Statistical Analysis

All raw scores were processed using SPSS Version 24 (SPSS Ltd) to produce the summary data. A small percentage of data was missing from the SMVQ, BDI and BAVQ Resistance (<7%, <2%, and <2% respectively); cases were therefore excluded pairwise for all further statistical analyses. Examination of distributions revealed no departures from normality other than marginal skewing towards high scores on BAVQ Resistance; this did not have a large impact on the mean, and consequently parametric tests were used for all analyses.

Pearson’s correlations were first calculated to examine relationships between variables. Hierarchical multiple regression analyses were then conducted to test whether mindfulness of voices predicted a significant amount of variance in each of the three voice-related impact variables (PSYRATS distress, PSYRATS disruption and BAVQ-R resistance), when voice topography and mood symptoms were controlled for. Consequently, predictor variables selected for the multiple regression model were the SMVQ total score, voice topography (PSYRATS frequency, duration and loudness) and mood symptoms (BDI and BAI). Variables were only entered into the model as predictors if they correlated significantly with the dependent variable in the initial correlational analysis. The main analysis used BAVQ-R resistance as the dependent variable; however, analyses were also repeated separately using only the BAVQ-R behavioural resistance items. Given the PSYRATS distress intensity and amount items
were highly correlated, these two variables were combined to create a single composite variable, which was used as the dependent variables for all relevant analyses. Assumption testing revealed the data met the assumption of multicollinearity, with correlations between independent variables <.7, and tolerance and VIF values of >0.10 and <10, respectively. Likewise, inspection of the normal probability plots and scatterplots revealed normality of residuals for all variables.

Results

Participant characteristics

Participants included 62 voice hearers (40.3% men) with a mean age of 40.23 years (SD 12.94; range 19-66). Participants had a diagnosis of schizophrenia (48.4%), schizoaffective disorder (17.7%), bipolar disorder (19.4%), or major depressive disorder (14.5%), and 42 participants were currently taking antipsychotic medication. Further demographic and clinical participant characteristics can be seen in Table 1.

Table 1. Descriptive Statistics for Demographic Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>40.23</td>
<td>12.94</td>
</tr>
<tr>
<td>Illness Duration (since diagnosis)</td>
<td>15.05</td>
<td>11.12</td>
</tr>
<tr>
<td>WTAR Scaled Score</td>
<td>103.70</td>
<td>10.81</td>
</tr>
<tr>
<td>Education (years)</td>
<td>14.16</td>
<td>2.81</td>
</tr>
</tbody>
</table>

Descriptive statistics

Descriptive statistics for all measures can be seen in Tables 2 and 3.

Correlational analysis

As seen in Table 4, Pearson’s correlations revealed significant negative associations between mindfulness of voices (SMVQ) and voice-related distress (PSYRATS) and resistance to voices (BAVQ-R). Additionally, when scores on items relating to emotional resistance were removed and only behavioural resistance was examined, this significant negative relationship remained. Furthermore, independent variables relating to voice topography (PSYRATS) and mood variables (BDI-II and
BAI) were examined to determine variables to be included in the hierarchical regression model. Analyses revealed significant positive associations between loudness of voices and voice-related distress, frequency and duration of voices and voice-related disruption and anxiety and resistance to voices. However, when emotional resistance items were removed, the relationships with behavioural resistance were no longer significant.
### Table 2. Descriptive Statistics for Variables of Voice Impact, Mood and Mindfulness

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Min.</th>
<th>Max.</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PSYRATS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditory Hallucinations total score</td>
<td>62</td>
<td>2</td>
<td>42</td>
<td>25.87</td>
<td>8.27</td>
</tr>
<tr>
<td>Distress (intensity + amount combined Z-score)</td>
<td>62</td>
<td>-1.97</td>
<td>1.33</td>
<td>.00</td>
<td>.94</td>
</tr>
<tr>
<td><strong>Beliefs About Voices Questionnaire – Revised</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>61</td>
<td>0</td>
<td>27</td>
<td>16.07</td>
<td>6.90</td>
</tr>
<tr>
<td>Behavioural resistance</td>
<td>61</td>
<td>0</td>
<td>15</td>
<td>8.87</td>
<td>4.53</td>
</tr>
<tr>
<td><strong>Beck Depression Inventory-II</strong></td>
<td>61</td>
<td>0</td>
<td>48</td>
<td>21.85</td>
<td>13.10</td>
</tr>
<tr>
<td><strong>Beck Anxiety Inventory</strong></td>
<td>62</td>
<td>0</td>
<td>63</td>
<td>23.29</td>
<td>14.37</td>
</tr>
<tr>
<td>Southampton Mindfulness of Voices Questionnaire</td>
<td>58</td>
<td>10</td>
<td>61</td>
<td>33.14</td>
<td>10.01</td>
</tr>
</tbody>
</table>

*Note.* Min = minimum; Max = maximum; PSYRATS = Psychotic Symptoms Rating Scales.

### Table 3. Descriptive Statistics for Voice Topography and Impact Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Min.</th>
<th>Max.</th>
<th>Md.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PSYRATS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>62</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Duration</td>
<td>62</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Loudness</td>
<td>62</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Disruption</td>
<td>62</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* Min = minimum; Max = maximum; Md = median; PSYRATS = Psychotic Symptom Rating Scales.
Table 4. Pearson’s Correlations for all Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlated with:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. SMVQ</td>
<td>-</td>
</tr>
<tr>
<td>2. PSYRATS Distress</td>
<td>-.40**</td>
</tr>
<tr>
<td>3. PSYRATS Disruption</td>
<td>-.18</td>
</tr>
<tr>
<td>4. PSYRATS Frequency</td>
<td>-.08</td>
</tr>
<tr>
<td>5. PSYRATS Duration</td>
<td>-.00</td>
</tr>
<tr>
<td>6. PSYRATS Loudness</td>
<td>-.20</td>
</tr>
<tr>
<td>7. BAVQ-R Resistance</td>
<td>-.53**</td>
</tr>
<tr>
<td>8. BAVQ-R Behavioural Resistance</td>
<td>-.39**</td>
</tr>
<tr>
<td>9. BDI-II</td>
<td>-.25</td>
</tr>
<tr>
<td>10. BAI</td>
<td>-.31*</td>
</tr>
</tbody>
</table>

Note. * p <.05, ** p <.01, *** p <.001 (two-tailed).
SMVQ = Southampton Mindfulness of Voices Questionnaire; PSYRATS = Psychotic Symptom Rating Scales; BAVQ-R = Beliefs About Voices Questionnaire – Revised; BDI-II = Beck Depression Inventory – II; BAI = Beck Anxiety Inventory.
Regression analyses

Hierarchical multiple regression analyses were conducted to test the amount of variance accounted for by mindfulness of voices in voice-related distress, disruption and resistance, when voice topography and mood were controlled for. Independent variables were only selected for inclusion in step 1 if they significantly correlated with the dependent variables. Subsequently, mindfulness of voices (SMVQ) was entered in step 2 of the analysis. Table 5 shows included independent variables and results from the hierarchical multiple regression analyses for the dependent variables.

Analyses revealed that when related voice topography (PSYRATS loudness) was controlled for, mindfulness of voices explained an additional 12% of variance in voice-related distress. In the final model, only mindfulness of voices was a significant predictor, recording a higher beta value than PSYRATS loudness. Results also demonstrated that after controlling for associated voice topography variables (PSYRATS frequency and duration), mindfulness of voices explained an additional 2% of the variance in voice-related disruption. Additionally, in the final model only voice topography variables significantly contributed to the prediction of voice-related disruption, with both variables recording higher beta values than mindfulness of voices.

Lastly, when related mood symptoms (anxiety; BAI) were controlled for, mindfulness of voices explained an additional 21% of the variance in resistance to voices. Furthermore, in the final model only mindfulness of voices was a significant predictor, demonstrating a higher beta value than anxiety. To assess the amount of variance mindfulness of voices explained when items were removed relating to the emotional resistance to voices, this analysis was run again using BAVQ behavioural resistance as the dependent variable. The analysis revealed similar results; however, the beta values recorded for both anxiety and mindfulness of voices were lower than in the previous analysis.
Table 5. Hierarchical Multiple Regression of Voice Impact variables

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Model</th>
<th>Independent variable</th>
<th>B</th>
<th>β</th>
<th>p-value</th>
<th>Adjusted ( R^2 )</th>
<th>Std. error of estimate</th>
<th>( R^2 ) change</th>
<th>Change statistics</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYRATS distress</td>
<td>1</td>
<td>PSYRATS Loudness</td>
<td>.36</td>
<td>.31</td>
<td>.017</td>
<td>.08</td>
<td>0.90</td>
<td>.10</td>
<td>6.09 1 56 .017</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>PSYRATS Loudness</td>
<td>.28</td>
<td>.24</td>
<td>.052</td>
<td>.19</td>
<td>0.84</td>
<td>.12</td>
<td>8.52 1 55 .005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMVQ</td>
<td>-.03</td>
<td>-.36</td>
<td>.005</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSYRATS disruption</td>
<td>1</td>
<td>PSYRATS Frequency</td>
<td>.51</td>
<td>.41</td>
<td>.002</td>
<td>.35</td>
<td>1.07</td>
<td>.37</td>
<td>16.31 2 55 .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PSYRATS Duration</td>
<td>.36</td>
<td>.30</td>
<td>.018</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>PSYRATS Frequency</td>
<td>.49</td>
<td>.39</td>
<td>.002</td>
<td>.36</td>
<td>1.06</td>
<td>.02</td>
<td>2.01 1 54 .162</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PSYRATS Duration</td>
<td>.37</td>
<td>.30</td>
<td>.015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMVQ</td>
<td>-.02</td>
<td>-.15</td>
<td>.162</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>BAVQ Resistance</td>
<td>1</td>
<td>BAI</td>
<td>.14</td>
<td>.29</td>
<td>.027</td>
<td>.07</td>
<td>6.66</td>
<td>.09</td>
<td>5.14 1 55 .027</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>BAI</td>
<td>.07</td>
<td>.14</td>
<td>.262</td>
<td>.27</td>
<td>5.90</td>
<td>.21</td>
<td>16.24 1 54 .001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMVQ</td>
<td>-.33</td>
<td>-.49</td>
<td>.000</td>
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<tr>
<td>BAVQ Behavioural resistance</td>
<td>1</td>
<td>BAI</td>
<td>.06</td>
<td>.20</td>
<td>.141</td>
<td>.02</td>
<td>4.44</td>
<td>.04</td>
<td>2.23 1 55 .141</td>
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<tr>
<td></td>
<td>2</td>
<td>BAI</td>
<td>.03</td>
<td>.08</td>
<td>.543</td>
<td>.13</td>
<td>4.20</td>
<td>.12</td>
<td>7.59 1 54 .008</td>
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<td>SMVQ</td>
<td>-.16</td>
<td>-.36</td>
<td>.008</td>
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*Note.* Std. = Standard; PSYRATS = Psychotic Symptom Rating Scales; SMVQ = Southampton Mindfulness of Voices Questionnaire; BAVQ-R = Beliefs About Voices Questionnaire – Revised; BAI = Beck Anxiety Inventory.
Discussion

Previous literature has proposed mindfulness to be of benefit for individuals with psychosis (Louise et al., 2017). Furthermore, findings from related cross-sectional studies suggest mindfulness may provide protection from distress, disruption, negative beliefs, dysfunctional relational style and responding, and mood symptoms for individuals who hear voices (Chadwick et al., 2007; Escudero-Pérez et al., 2016; Morris et al., 2014; Perona-Garcelán et al., 2016). This study extended these findings by specifically examining the associations between mindful responding to voices and voice-related negative impacts, with the hope of establishing whether mindfulness may help people adapt to the experience of hearing voices. Also, a secondary aim was to pinpoint more specific psychological treatment targets for persistent voices.

Hypotheses were supported by current findings, which revealed mindfulness of voices correlated negatively with voice-related distress and resistance to voices (overall and behavioural). This suggests higher levels of mindful responding to voices was related to less intense and less frequent feelings of distress associated with voice-hearing experiences. Likewise, increased mindful relating to voices was associated with decreased use of habitual emotional and behavioural resistant responses, such as experiential avoidance and struggle. Furthermore as predicted, regression analyses revealed when associated voice topography and mood symptoms were controlled for, mindful relating to voices explained a significant proportion of variance in voice-related distress and resistant responding to voices.

From a theoretical perspective, these findings align with past literature suggesting it is important for psychological treatments to target an individual’s relationship with voices, including the existence of habitual coping responses, such as experiential avoidance (Abba et al., 2008; Chadwick, Hughes, Russell, Russell, & Dagnan, 2009). Once clients are able to develop a greater awareness of their voices and individual responses to such experiences, interventions may benefit from teaching or refining trait mindfulness skills specifically relating to non-judgemental awareness, mindful observation and acceptance of the voice-hearing experience (Strauss et al., 2015). Additionally, findings suggest that voice topography may not be a required
treatment target when developing interventions to help alleviate voice-related distress and resistance. Furthermore, current findings suggest that mindfulness interventions may not just alleviate overall distress or mood symptoms, but may be able to specifically target the negative impacts of the voice-hearing experience itself. The influence of voice topography and mood on mindful responding and negative voice-related impacts has not been explored by related cross-sectional and intervention studies to date (Chadwick et al., 2007; Chadwick et al., 2016; Escudero-Pérez et al., 2016; Morris et al., 2014; Perona-Garcelán et al., 2016). Given the strong roots of mindfulness in the treatment of depression, these findings are particularly important in demonstrating that specific voice-related distress, rather than overall distress, may benefit from mindfulness training (Hofmann, Sawyer, Witt, & Oh, 2010).

The current study failed to find an association between levels of mindfulness of voices and the extent of voice-related disruption. Hence, whilst mindfulness may help individuals who hear voices experience less emotional distress, these benefits do not appear to translate to an impact on their functioning. This is in line with previous cross-sectional research (Morris et al., 2014), and intervention results for mindfulness for psychosis more broadly on quality of life and functioning (Louise et al., 2017).

Clinically, these findings indicate that provision of interventions aimed at assisting clients to become more mindful of experienced voices may be helpful in relation to managing the negative emotional experience of voices, but that addressing mindfulness alone may not be sufficient to produce changes in client functioning (Morris et al., 2014). Consequently, mindfulness should perhaps not be seen as a stand-alone intervention for persistent voices, but may be more beneficial when delivered in conjunction with broader rehabilitation and recovery interventions.

Despite encouraging findings of mindfulness-based interventions for psychotic symptoms (Louise et al., 2017), only one RCT to date has assessed the efficacy of a mindfulness program designed specifically for distressing voices (Chadwick et al., 2016). Given current findings suggesting mindfulness may act as a protective factor against voice-related negative impacts, it is recommended that further mindfulness-based protocols for persistent voices be developed and evaluated.
Limitations and recommendations

Limits to the methodological design included reduced statistical power of regression analyses due to a small sample size. Similarly, given the cross-sectional design of this study, directionality and the establishment of causal relationships cannot be inferred by current results, and therefore conclusions drawn should be considered theoretical in nature and in the context of previous literature. Secondly, limitations exist regarding study measures of voice-related distress and disruption. These single item measures from the PSYRATS have demonstrated inconsistent findings in previous literature (Chadwick et al., 2007; Morris et al., 2014) and have been criticised for being insensitive indices of voice-related symptomatology (Birchwood, Shiers, & Smith, 2014; Thomas, Hayward, Strauss, & McCarthy-Jones, 2014). Future studies may benefit from assessing voice-related distress and disruption using measures that capture these symptoms with more specificity and range; such measures are in development (Voices Impact Scale; Thomas, Rossell, & Waters, 2015). Lastly, generalizability of these findings is limited by a lack of information regarding previous exposure of participants to mindfulness and related strategies. Consequently, it is not known whether mindful relating to voices reflected a naturally arising trait or indexed previous exposure to mindfulness training.

Conclusion

In summary, this study explored the relationships between mindful relating to voices and voice-related distress, disruption and resistance. Current findings, in the context of previous literature, provide theoretical support that mindfulness may help people adapt to the experience of hearing voices. Results indicate that mindfulness of voices related to reduced severity of voice-related distress and less resistant responding to voices. However, these observed levels of negative voice impacts associated with mindfulness do not appear to relate to voice-related functional impairment. Given the extension of current findings to previous literature, it is recommended that further mindfulness-based interventions that target response style to persistent voices be established and trialled by future research.
Acknowledgments

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Conflict of interests

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

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CHAPTER 5: EMPIRICAL STUDY TWO

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CHAPTER 6: THE ACCEPTABILITY, FEASIBILITY AND POTENTIAL OUTCOMES OF AN INDIVIDUAL MINDFULNESS-BASED INTERVENTION FOR HEARING VOICES
6.1 Preamble to Empirical Study 3

This chapter presents the third empirical study conducted as part of this thesis. In Chapter 4 meta-analytic results were presented, which indicated third-wave interventions are effective for the treatment of psychotic symptoms and depressive symptoms, in the context of psychosis. Whilst these results showed strongest support for mindfulness-based approaches, the systematic literature search revealed only one RCT had utilised a mindfulness protocol specifically for distressing voices, and no studies had investigated the effects of a mindfulness protocol for psychosis in individual format. Subsequently, Chapter 5 presented findings, which provided theoretical support that mindfulness is associated with better adaptation to the experience of hearing voices. Results suggested that mindfulness of voices was associated with reduced voice-related distress and resistant responding to voices. To further extend on the findings from empirical studies 1 and 2, study 3 aimed to develop an individual mindfulness protocol for persistent voices and examine the acceptability, feasibility and potential effectiveness of this intervention. Additionally, study 3 aimed to investigate potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention.

This empirical paper is currently under review with Behavioural and Cognitive Psychotherapy. This is an international multidisciplinary journal that disseminates scholarly research relating to the theory, practice and evolution of cognitive and behaviour therapy. The five-year impact factor for this journal is currently 1.923. The ‘Author Indication Form’, which details the nature and extent of the candidate and co-authors’ contributions to this empirical paper is included in Appendix E. The complete citation is as follows:

6.2 The acceptability, feasibility and potential outcomes of an individual mindfulness-based intervention for hearing voices

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Abstract

Background: A prominent area of advancement in the psychological treatment for persons with persisting psychosis has been the application of mindfulness-based therapies. Recent literature has recommended the investigation of focussed mindfulness interventions for voices (auditory hallucinations) as a specific experience. To date, only mindfulness programs in group-format have been examined.

Aims: This pilot study aimed to assess the acceptability, feasibility and potential outcomes of an individual mindfulness program for persistent voices on the negative impact of voices on the subjective experience of mental health and wellbeing, depression and voice-related distress and disruption. Also, it aimed to identify potential psychological and neurocognitive mechanisms of change.

Method: A new 4-week individual Mindfulness Program for Voices (iMPV) was developed, and piloted with a group of 14 participants with a schizophrenia-spectrum disorder and persisting voices. Participants completed clinical and neurocognitive measures pre and post-intervention and at two-month follow-up.

Results: Results revealed low attrition rates, high formal practice engagement levels and positive participant feedback. Pre-post outcomes suggested small-to-moderate effects for a reduction in the negative impact of voices on experience, depression and disruption. Large effects for changes in mindful responding and attentional switching were also identified.

Conclusions: Our findings suggest this novel treatment protocol is appropriate, engaging and safe for persistent voice hearers. Findings for mindful responding and attentional switching suggest these to be potential mechanisms of change to further investigate. Further large-scale RCTs are warranted to ascertain the efficacy for focussed mindfulness interventions for voices of individual format.

Keywords: mindfulness, meditation, psychosis, auditory verbal hallucinations, voices, voice-hearing, attention.
CHAPTER 6: EMPIRICAL STUDY THREE

Introduction

Up to 50% of individuals with psychosis experience persisting positive psychotic symptoms, such as auditory verbal hallucinations (or ‘voices’) and delusions, despite the use of antipsychotic medication (Elkis, 2007). Treatment of these refractory symptoms has been a major target in the development of psychological therapies for psychosis (Burns, Erickson, and Brenner, 2014). Cognitive Behavioural Therapy (CBTp) is currently the primary recommended psychological treatment targeting psychotic symptoms in clinical practice guidelines (e.g. NICE, 2014). CBTp has been found to be moderately effective for medication-resistant positive symptoms (Burns et al., 2014), and more specifically for the treatment of hallucinations (van der Gaag, Valmaggia, and Smit, 2014). However, there has been increasing interest in applying third-wave therapies that promote mindfulness and acceptance (Khoury, Lecomte, Gaudiano, and Paquin, 2013; Thomas et al., 2014).

Mindfulness has been one of the most prominent areas of psychosis treatment advancement since the development of CBTp (Thomas et al., 2014), with small-moderate pre-post treatment effects on positive symptoms being reported by a previous meta-analysis (Hedge's $g = 0.32$; Khoury et al., 2013). Mindfulness involves non-judgementally, and purposely, paying attention to present-moment experiences (Kabat-Zinn, 1994), a skill that can be applied to positive psychotic experiences. In psychosis, as in other populations, mindfulness is typically cultivated through formal meditation practices and experiential exercises, via group-format courses (Strauss, Thomas and Hayward, 2015). However, mindfulness has frequently been included as a small, and often optional, component of broad multi-component interventions, such as Acceptance and Commitment Therapy (ACT), with formal mindfulness practice often being encouraged but not a core element of the therapy (Strauss et al., 2015). Yet, qualitative feedback from such multi-component approaches often specifically mentions the acceptability and perceived benefits of mindfulness (Bacon, Farhall, and Fossey, 2014).

More focussed psychological interventions may be simpler to disseminate than formulation-based multi-component approaches (e.g. CBTp and ACT) that require advanced therapy skills (Thomas, 2015; Thomas et al., 2014). Given the widespread
popularity of mindfulness among practitioners, development of a mindfulness protocol for voices is timely. Additionally, extant research on interventions with a primary focus on mindfulness has been solely of group format delivery (Strauss et al., 2015). However, in practice, psychological therapies for people with psychosis are typically delivered one-to-one. Research needs to be pragmatic in considering the effectiveness of interventions in this format, in order to inform evidence-based practice and facilitate dissemination. Furthermore, hearing voices and psychotic phenomenology present heterogeneously, thus it is possible that one-to-one delivery of MBIs may have greater treatment effects than group delivery, as has been observed for individual versus group CBTp (van der Gaag et al., 2014).

Although several randomised control trials (RCTs) have considered outcomes of focused MBIs for psychosis (Chadwick et al., 2016; Chien and Lee, 2013; Chien and Thompson, 2014; Langer, Cangas, Salcedo, and Fuentes, 2012; López-Navarro et al., 2015), to date only one of these trials has focussed on the impact on distressing voices (Chadwick et al., 2016). Strauss and colleagues (2015) have proposed several theoretical reasons for the potential benefits of MBIs for distressing voices: 1) active acceptance of voices as an alternative to suppression or resistance, 2) targeting of the rumination and worry found to be associated with persistent voice hearing, 3) decentring as a protective factor against negative voice content/cognitions, and 4) mindful observation as an alternative to preoccupation with verbal dialogue.

Additionally, developing targeted therapeutic approaches enables more precision in examining the efficacy for, and potential mechanisms of change involved in mindfulness training for voices, by reducing the confounds of other therapeutic processes (Strauss et al., 2015; Thomas, 2015); akin to the interventionist-causal paradigm that has been applied to other experiences in psychosis (Brand, Rossell, Bendall, and Thomas, 2017; Farrelly, Peters, Azis, David, and Hunter, 2016; Freeman, 2011). Potential mechanisms of change identified by qualitative literature include: 1) reorientation of attention away from voices, 2) decentring, and 3) acceptance of voices (Strauss et al., 2015). For instance, previous literature has suggested individuals who experience hearing voices have less control over their ability to switch their attention, which may be the result of increased attentional resources on the voice hearing
experience (Hugdahl, 2009; Waters et al., 2012). These deficits in attentional switching or set-shifting have also been evidenced through significantly poorer performance on the Trail Making Test - Part B, compared with healthy controls (Siddi et al., 2017). Additionally, past research suggests mindfulness training, even in the short-term, can improve specific attention processes, such as attentional control or switching and sustained attention (Chambers, Lo, and Allen, 2008; Jha, Krompinger, and Baime, 2007; Tang et al., 2007).

In this study, an individual, brief mindfulness intervention for persistent voices (iMPV; individual Mindfulness Program for Voices) was developed and evaluated. The aim of the current pilot study was to ascertain the acceptability and feasibility of this program with persistent voice hearers. Feasibility and pilot studies are often conducted in advance of larger randomised controlled trials to determine whether procedures are sufficiently feasible for larger trialling to be worthwhile (Lancaster, Dodd, & Williamson, 2004). Whilst feasibility studies may include questions of recruitment and retention rates, in developing an MBI for voices, prominent feasibility questions concern whether such a focused intervention can be successfully delivered and engaged with, for example, whether a client group with persisting psychosis would be able to engage in exercises during appointments, complete homework, and find the use of mindfulness acceptable. Hence these were the focus of this study. This study also examined the potential effects of this program to reduce the negative impact of voices on the subjective experience of mental health and wellbeing, as well as depression, voice-related distress and disturbance. Also, we aimed to obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention.

**Methods**

**Design**

The study was designed to assess the feasibility and acceptability of the intervention and provide preliminary outcome data. The protocol was initially tested with the four participants, who completed the assessment measures at two time points, approximately one month apart (Time 1 and Time 2). Following this, a baseline-
controlled pilot study design was adopted including two pre-intervention time points
one month apart (Time 0 and Time 1), as well as post-treatment (Time 2) and a follow-
up two months later (Time 3). Given the small overall sample size, the authors decided,
prior to analysis, to use data from the first four participants were included in the
examination of pre- to post- effects as a method for maximising numbers for analyses.

Participants

Overall, 14 participants were recruited from a specialist Voices Clinic and
partner networks in Melbourne, Australia. Inclusion criteria were: 1) a previous
diagnosis of schizophrenia or schizoaffective disorder, 2) between the ages of 18 and
65, 3) experienced hearing persistent medication-resistant voices for more than two
years, and 4) these voices are currently experienced at least once per week. Exclusion
criteria were: 1) history of stroke, neurological illness or epilepsy, 2) English as a
second language, 3) a current substance abuse disorder, 4) a past head injury or
significant loss of consciousness, 5) a Wechsler Test of Adult Reading (WTAR;
Wechsler, 2001) estimated IQ < 70, or 6) having commenced a new antipsychotic
medication within the previous two months. A basic telephone screen of eligibility was
conducted prior to participants providing informed written consent. Participants were
financially reimbursed for assessment sessions.

Intervention

Individual Mindfulness Program for Voices (iMPV)

The current intervention was developed by SL under the supervision of NT. The
intervention was based on Mindfulness Based Cognitive Therapy (MBCT; Segal,
Williams, & Teasdale, 2002) and Mindfulness-Based Stress Reduction (MBSR; Kabat-
Zinn, 1994) approaches, incorporating adaptations described by Chadwick, Taylor, and
Abba (2005) and Thomas, Morris, Shawyer, and Farhall (2013) for individuals who
hear voices, and previous experience of applying mindfulness to voices in a specialist
Voices Clinic.

iMPV entailed four weekly one-hour sessions. The therapist was trained in
MBCT and had received training in CBTp and ACT for psychosis. Sessions were of
individual format and included guided mindfulness practice alongside discussions around mindful responding as an alternative to habitual reactions to voices, non-judgemental awareness of voices and acceptance of symptoms and self. Sessions one and two provided an introduction to the foundations of mindfulness and sessions three and four focussed specifically on mindful responding to voices. Home mindfulness practice between sessions was facilitated with handouts, audio recordings of guided mindfulness exercises on an MP3 device and a home practice record.

In contrast with existing mindfulness interventions, this mindfulness protocol for voices included several experiential practices that simulated the voice hearing experience. These were used to produce voice-like stimuli with which to practice mindfulness skills with the therapist, given that the participants’ own hallucinated voices are often not reliably present in-session. For instance, participants were first introduced to the concept of mindful responding to voices using a pre-recording of speech playing during a mindfulness of breath practice. This enabled participants to practice mindfully observing and noting voice topography. A recording of speech selected to be boring, rather than engaging, was used for initial practice to minimise its salience in capturing attention during initial practice. Subsequently, to simulate the emotional reaction to negative voice content often reported by clients, mindfulness of breath practices were completed with pre-recorded individual voice content from each participant playing in the background. This facilitated the practice of mindful responding to voices under more realistic conditions in regard to attentional resources and mood state.

Additional precautions were taken to reduce the likelihood for participants to become preoccupied with internal psychotic experiences for long periods of time. For instance, mindfulness practices were kept to a maximum of 15 minutes and participants were instructed to practice with their eyes open and gazed dropped, if this felt more comfortable. Lastly, the focus of home practice in the third and fourth sessions was practicing letting go of habitual reactions to voices (e.g. resistance or avoidance) and informally and formally practicing to mindfulness observe and respond to voice hearing experiences.
Further details of the session content can be seen in Table 1.

**The use of technology to overcome participant engagement barriers**

It is important to highlight the use of technology within iMPV. Participants often report difficulties engaging with home mindfulness practice. There are a variety of reasons for this; however, one significant barrier that has been identified by the authors, is the common use of audio CDs in mindfulness-based interventions. Participants often report they either do not have CD players, or if they do these players are located within common areas of their residence. To try and overcome this barrier for engagement, the iMPV trial provided audio files of guided mindfulness practices on an MP3 player. This player was inexpensive and battery operated, with spare batteries provided to participants to address any charging complications.

Additionally, a voice loop smartphone application was used to record participant’s specific voice content to play during the mindfulness of breath practice in the third session. This application made this process time efficient and easy to complete in collaboration with participants within the session. Lastly, a portable speaker connected to a smartphone used by the therapist, was used to play the ‘boring speech recording’ and the specific voice content recorded on the voice loop application, during the mindfulness of breath practices within sessions three and four.
Table 1. iMPV Session Content

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<thead>
<tr>
<th>Session One</th>
<th>Current coping and an introduction to mindfulness</th>
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<tr>
<td></td>
<td>Body scan (15 min)</td>
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<td>Body scan</td>
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<td>Daily mindful activity</td>
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<th>Session Two</th>
<th>Choiceless awareness</th>
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<td>Breathing space (3 min)</td>
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<td>Mindful hearing (5 min)</td>
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<td>Mindful stretching</td>
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<td>Daily mindful activity</td>
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<th>Session Three</th>
<th>Mindful observation: Noting and observing voices</th>
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<td>Mindfulness of breath (10 min)</td>
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<td>Boring speech recording</td>
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<td>Specific voice content recording</td>
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<td></td>
<td>Breathing space</td>
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<td>Mindfulness of breath</td>
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<td>Mindful responding to voices</td>
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<th>Session Four</th>
<th>Acceptance and letting go of habitual reactions</th>
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<td>Mindful hearing (5 min)</td>
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<td></td>
<td>Mindfulness of breath (10 min)</td>
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<td></td>
<td>Specific voice content recording</td>
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<td></td>
<td>Breathing space</td>
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<td>Mindfulness of breath</td>
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<td>Mindful responding to voices</td>
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Measure

All assessments were conducted in face-to-face interviews (the current article presents data on main outcomes only). Prior to the baseline assessment, participants were asked to provide demographic information, the Wechsler Test of Adult Reading (WTAR; Wechsler, 2001) as an estimate of premorbid intellectual functioning, and the Positive and Negative Symptom Scale (PANSS; Kay, Fiszbein, and Opler, 1987) to index severity of baseline positive and negative psychotic symptomatology.

Primary outcome.

Subjective Experience of Psychosis Scale (SEPS; Haddock et al., 2011) – Negative impact of experience subscale

The SEPS is a self-report questionnaire measure of the impact of psychotic experiences in the last week on 29 domains identified by consumers as impacted upon by psychotic experiences (e.g. concentration; ability to socialise; levels of anxiety and stress). Items of the SEPS are answered using a 5-point response format (1, not at all, to 5, very much), with two ratings given for both the negative impact on the domain, and the positive impact. The SEPS was administered with a specific instruction to rate the impact of hearing voices.

Secondary outcomes.

Psychotic Symptoms Rating Scales – Auditory Hallucinations (PSYRATS; Haddock, McCarron, Tarrier, and Faragher, 1999)

A measure of the specific characteristics of auditory hallucinations, consisting of 11 items assessing: frequency, duration, location, loudness, beliefs about origin, amount and degree of negative content, amount and intensity of distress, disruption and control. Items are 5-point (0 to 4) anchored interviewer-rated scales, with higher scores indicating greater severity. The scale was given to patients to obtain specific information about voice-related distress, disruption and voice topography (frequency, duration, loudness).
**Calgary Depression Scale for Schizophrenia (CDSS; Addington, Addington, and Maticka-Tyndale, 1993)**

A measure of depressive symptoms over the previous two weeks designed to assess depression in individuals with schizophrenia, separate from positive and negative symptomatology. The scale consists of nine interviewer-rated items, each ranging from 0 \((\text{absent})\) to 3 \((\text{severe})\). The CDSS was used to measure the severity of and changes in participants’ depressive symptoms.

**Process measures**

**Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008)**

The SMQ was given to patients to measure usual responses to and relationships with distressing thoughts and images. The SMQ consists of 16 self-report items that are answered on a 7-point strongly disagree to strongly agree Likert scale, with eight items keyed positively and eight negatively. Item scores are summed to generate a total score ranging from 0 to 96, with higher scores indicating a greater degree of mindful responding. Four additional factor scores can be calculated for Mindful Observation, Letting Go, Absence of Aversion and Non-Judgement.

**Attentional switching**

**Delis-Kaplan Executive Function System (D-KEFS; Delis, Kaplan, and Kramer, 2001) - Color-Word Interference Test – switching condition**

The D-KEFS Color-Word Interference Test is designed to assess inhibition and attentional switching or set-shifting in individuals aged between 8 and 89 years (Delis et al., 2001; E. Strauss, Sherman, and Spreen, 2006). The test consists of four conditions, each comprising 40 stimuli. Condition one required respondents to name patches of colour. In the second condition, respondents are required to read colour names written in black ink. The third condition requires respondents to name the dissonant ink colour that words are written in. In the fourth condition, respondents are required to switch between naming the dissonant ink colour and reading the words. Each condition is timed and both self-corrected and unknown errors are summed for each condition to
calculate a score for both raw time and total errors, ranging from 1 to 40, with higher scores indicating greater number of errors (Delis et al., 2001; E. Strauss et al., 2006).

**Trail Making Test - Part B (TMT-B; Reitan, 1992)**

The second component in the Trail Making Test, TMT-B is a paper and pencil task that was administered to participants as a measure of executive functioning and more specifically visual attention and cognitive switching. The test consists of 25 circles, randomly placed on a page, with numbers 1 to 13 and letters A to L within the circle. Participants are required to connect the circles in sequential order, but alternating between numbers, in ascending order, and letters, in alphabetical order. The aim of the task is to connect the circles as fast as possible, whilst still maintaining accuracy. The primary score calculated for TMT-B is the time taken to complete the task, with higher scores indicating poorer task performance.

**Sustained attention**

**Continuous Performance Task (CPT; Riccio, Reynolds, Lowe, and Moore, 2002)**

The CPT is a computer-based task that was given to patients to assess selective and sustained attention. The task requires participants to observe a series of digit sequences and respond with a mouse click each time a sequence is presented that is identical to the one shown just prior. The task consists of three trials: two digit sequences, three digit sequences and four digit sequences. Scores are generated for the number of hits (correct responses) and two types of commission errors; false alarms (responses to nearly identical digits) and random errors. Signal detection analyses combine hit and false alarm information, for each of the three conditions, into d-prime (d') scores, which signify the ability to discriminate identical pairs from nearly identical pairs. These scores are averaged to create a total summary score, with higher scores indicating greater attention.

The neurocognitive battery was administered using counterbalancing to reduce order effects and fatigue.
Participant feedback

In addition to the repeated outcome measures above, participants provided feedback to assist with the program development process, in the form of a short qualitative interview during the post-assessment. Feedback items included ‘do you think you are likely to continue with formal mindfulness practice?’ and ‘would you recommend mindfulness for other people who experience hearing voices?’.

Statistical Analysis

All raw scores were processed using SPSS Version 24 (SPSS Ltd) to produce the summary data. Differences on measures between the two pre-intervention time points (Time 0 and Time 1) were all small and non-significant ($p > .1$). Consequently, only pre-intervention data from Time 1 was included in further analyses, and the four cases from the initial phase of the study were included in Time 1 to Time 2 contrasts to maximise numbers for analyses and increase statistical power. Descriptive data were then derived to show change from Time 1 to Time 2, and Time 1 to Time 3, on each of the outcome variables. Confidence intervals for change scores were calculated using the $t$ distribution for paired samples, also used to derive significance levels. Wilcoxon Signed-Ranks tests, most suitable for ordinal data, were conducted to derive significance levels for PSYRATS items. Standardised effect sizes were expressed as Hedge’s $g_{av}$ (bias-adjusted standardised mean difference) for all change scores, as recommended for sample sizes < 20 (Lakens, 2013). Analyses were conducted on a per-protocol basis for the participants ($n = 12$) who completed the iMPV program.

Results

Participant characteristics

Participants included 14 persistent voice hearers (43% men) with a mean age of 42.8 years (SD 12.2; range 26-62). All participants had a diagnosis of schizophrenia (79%) or schizoaffective disorder (21%). Further demographic and clinical participant characteristics at baseline can be seen in Table 2.
Table 2. Demographic and Clinical Participant Characteristics at Baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>42.79</td>
<td>12.16</td>
</tr>
<tr>
<td>Illness Duration (since diagnosis)</td>
<td>17.31</td>
<td>8.92</td>
</tr>
<tr>
<td>WTAR Scaled Score</td>
<td>106.85</td>
<td>13.82</td>
</tr>
<tr>
<td>Education (years)</td>
<td>14.96</td>
<td>2.30</td>
</tr>
<tr>
<td>Psychotic Symptoms (PANSS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive subscale</td>
<td>21.79</td>
<td>4.90</td>
</tr>
<tr>
<td>Negative subscale</td>
<td>16.14</td>
<td>7.17</td>
</tr>
<tr>
<td>General subscale</td>
<td>37.79</td>
<td>8.15</td>
</tr>
<tr>
<td>Total score</td>
<td>75.71</td>
<td>16.98</td>
</tr>
</tbody>
</table>

Calgary Depression Scale: 4.43 (SD = 3.23)

**Acceptability and feasibility**

**Attrition**

Of the 28 potential participants who were referred to the study and screened for eligibility, seven declined participation and seven did not meet inclusion criteria. Overall, 14 participants completed consent procedures and baseline assessments. Two participants dropped out of the study during the intervention phase: one participant (one session attended) said they preferred practicing a different form of meditation (in which they detached from awareness of present moment experiences), and one participant (one session attended) only wanted to continue participation if paid for the therapy sessions in addition to research assessments (this was not part of the protocol or budget). The remaining 12 participants completed all four iMPV sessions.

**Engagement**

**Formal practice completion rates**

During sessions, the 12 participants completed all eight of the in-session formal mindfulness practices used. In regard to home practice, on average participants completed 10.29 (SD = 10.94) short (< 5 mins) and 4.56 (SD = 2.25) long (> 5 mins) formal mindfulness practices per week. In total, participants completed an average of 67.76 (SD = 37.64) minutes of formal home practice per week.
Safety

To examine whether there was any evidence of the iMPV intervention leading to increases in hearing voice severity, the Reliable Change Index (RCI; Jacobson and Truax, 1991) was calculated for two participants whose PSYRATS Auditory Hallucination total scores were higher at post-intervention. Using baseline internal consistency to index reliability, neither of these participants showed an increase that represented reliable change (>1.96).

Participant feedback

All 12 participants said they would recommend mindfulness for other people who experiences hearing voices. Of the most elaborated quotes from the interview, one participant stated ‘…I think it can help everybody who experiences hearing voices. I think it can help everybody in general’ and another participants stated ‘Yes I would, to calm you down, focus your attention and get yourself away from the hassle and trial that you are going through and have a new focus on your wellbeing’.

Feedback also revealed that all 12 participants indicated they thought they were likely to continue with formal mindfulness practice, with one participant stating ‘…I’ll do it regularly, because it calms me down, slows me down’ and another participant stating ‘…because now I’ve got meditation tapes, so it will be a lot easier to focus and practice’.

Outcomes

Post-intervention outcomes

Results on outcome and process variables can be seen in Tables 3 and 4, respectively. As recommend in guidelines for good practice for the analysis of pilot studies (Lancaster et al., 2004), the focus of the results is on the estimates of the treatments effects and corresponding 95% CIs for the mean difference, rather than providing definitive hypothesis tests, but p values are reported for completeness.

On the primary outcome measure, SEPS Negative Impact of Experience, a moderate effect was observed from pre- to post-intervention, which was statistically
significant in spite of the small sample. Among the secondary outcomes, moderate (and statistically significant) effects were also observed for depressive symptoms, and voice-related disruption. Small-to-moderate effects were estimated on other PSYRATS dimensions, but these were not statistically significant.

**Process measures**

SMQ total scores increased with a large effect size following the iMPV program, found to be statistically significant. When examined on a factor level, the largest effects were seen for Absence of Aversion and Non-Judgement scores.

In regard to attentional switching, a significant and large effect for a reduction in errors on the switching condition of the Colour-Word Interference Test following mindfulness intervention was found. In contrast, no significant pre-post changes were observed for time on the switching condition of the Colour-Word Interference Test, TMT-B raw time or CPT mean raw score following iMPV.

**Follow-up**

A total of eight participants continued on to complete a two-month follow-up assessment. In regard to the primary outcome, the change from pre ($M = 73.50, SD = 20.92$) to follow-up ($M = 81.00, SD = 26.37$) of 8.42 (95% CI [-9.47, 24.47], Hedge’s $g_{av} = 0.28$) was in the small effect size range, and was not statistically significant, $t(7) = -1.05$, $p = .331$. Similarly, analyses revealed there were no longer significant changes from pre-follow-up on all secondary and process outcomes, with small effects identified.
Table 3. Pre-Post Descriptive Statistics and Paired Samples t-test Results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>n</th>
<th>Pre</th>
<th>Post</th>
<th>Mean Difference [95% CI]</th>
<th>p</th>
<th>t</th>
<th>Hedge’s gav</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEPS Negative Impact of Experience</td>
<td>12</td>
<td>75.33 19.57</td>
<td>64.92 19.81</td>
<td>10.41 [0.49, 20.34]</td>
<td>.041</td>
<td>2.31</td>
<td>0.49</td>
</tr>
<tr>
<td>Calgary Depression Scale</td>
<td>12</td>
<td>5.00 3.10</td>
<td>3.50 2.58</td>
<td>1.50 [0.19, 2.81]</td>
<td>.029</td>
<td>2.51</td>
<td>0.49</td>
</tr>
<tr>
<td>PSYRATS AH Total score</td>
<td>12</td>
<td>25.42 6.60</td>
<td>23.50 7.96</td>
<td>1.92 [-1.03, 4.87]</td>
<td>.180</td>
<td>1.43</td>
<td>0.24</td>
</tr>
<tr>
<td>SMQ Total score</td>
<td>12</td>
<td>43.25 13.92</td>
<td>53.75 14.06</td>
<td>-10.5 [-19.15, -1.85]</td>
<td>.022</td>
<td>-2.67</td>
<td>0.70</td>
</tr>
<tr>
<td>Mindful Observation</td>
<td>12</td>
<td>13.42 5.37</td>
<td>13.17 5.37</td>
<td>0.25 [-1.46, 1.97]</td>
<td>.754</td>
<td>3.21</td>
<td>0.04</td>
</tr>
<tr>
<td>Letting Go</td>
<td>12</td>
<td>10.25 5.36</td>
<td>12.42 3.29</td>
<td>-2.17 [-4.69, 0.36]</td>
<td>.086</td>
<td>-1.89</td>
<td>0.45</td>
</tr>
<tr>
<td>Absence of Aversion</td>
<td>12</td>
<td>9.67 3.77</td>
<td>14.42 5.10</td>
<td>-4.75 [-7.95, -1.55]</td>
<td>.007</td>
<td>-3.27</td>
<td>0.99</td>
</tr>
<tr>
<td>Non-Judgement</td>
<td>12</td>
<td>9.92 4.10</td>
<td>13.75 4.47</td>
<td>-3.83 [-7.43, -0.24]</td>
<td>.039</td>
<td>-2.35</td>
<td>0.83</td>
</tr>
<tr>
<td>D-KEFS CWIT-switching (time)</td>
<td>12</td>
<td>1.42 11.31</td>
<td>0.68 11.19</td>
<td>0.74 [-5.00, 6.47]</td>
<td>.783</td>
<td>0.28</td>
<td>0.05</td>
</tr>
<tr>
<td>D-KEFS CWIT-switching (total errors)</td>
<td>12</td>
<td>2.08 1.83</td>
<td>1.00 0.85</td>
<td>1.08 [0.02, 2.15]</td>
<td>.047</td>
<td>2.24</td>
<td>0.71</td>
</tr>
<tr>
<td>TMT-B Raw time</td>
<td>11</td>
<td>66.53 19.39</td>
<td>59.48 12.80</td>
<td>7.05 [-3.87, 17.97]</td>
<td>.181</td>
<td>1.44</td>
<td>0.50</td>
</tr>
<tr>
<td>CPT Mean raw score</td>
<td>12</td>
<td>2.34 0.96</td>
<td>2.41 0.92</td>
<td>-0.07 [-0.24, 0.10]</td>
<td>.402</td>
<td>-0.87</td>
<td>0.07</td>
</tr>
</tbody>
</table>


Table 4. Descriptive Statistics and Wilcoxon Signed-Rank Test Results for PSYRATS Items

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre</th>
<th>Post</th>
<th>Sig.</th>
<th>Hedge’s gav</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Md</td>
<td>Min</td>
<td>Max</td>
<td>Md</td>
</tr>
<tr>
<td>PSYRATS Voice-related distress (amount)</td>
<td>2.00 0.00 4.00</td>
<td>1.00 0.00 3.00</td>
<td>.075</td>
<td>-1.78</td>
</tr>
<tr>
<td>PSYRATS Voice-related distress (intensity)</td>
<td>2.00 0.00 4.00</td>
<td>1.00 0.00 4.00</td>
<td>.313</td>
<td>-1.00</td>
</tr>
<tr>
<td>PSYRATS Disruption</td>
<td>1.00 1.00 3.00</td>
<td>1.00 0.00 2.00</td>
<td>.034</td>
<td>-2.12</td>
</tr>
<tr>
<td>PSYRATS Frequency</td>
<td>2.00 1.00 4.00</td>
<td>2.00 1.00 4.00</td>
<td>.157</td>
<td>-1.41</td>
</tr>
<tr>
<td>PSYRATS Duration</td>
<td>2.00 1.00 4.00</td>
<td>2.00 1.00 4.00</td>
<td>.083</td>
<td>-1.73</td>
</tr>
<tr>
<td>PSYRATS Loudness</td>
<td>2.00 0.00 4.00</td>
<td>1.50 1.00 4.00</td>
<td>.262</td>
<td>-1.12</td>
</tr>
</tbody>
</table>

Note. PSYRATS: Psychotic Symptom Rating Scales
Discussion

This article has described a novel brief MBI for persistent voice hearers of individual format (iMPV). Hallucination specific focussed mindfulness programs are still emerging in the literature (Chadwick et al., 2016), and the authors believe this is the first reported MBI for persistent voices of individual delivery modality. The current study aimed to establish the acceptability, feasibility and potential effectiveness of this program on the negative impact of voices on the subjective experience of mental health and wellbeing, as well as depression, voice-related distress and disturbance. The study also aimed to identify potential psychological and neurocognitive mechanisms of change that warrant further examination, and is subsequently the first trial of an MBI for psychosis that has assessed for changes in executive attention.

Findings demonstrated low participant attrition rates, high session attendance, high in-session and at-home formal practice engagement levels, and positive participant feedback. These indicate that this program is both acceptable and feasible for individuals with psychosis, suggesting that not only are persistent voice hearers able to complete formal mindfulness practices, but they also value learning mindfulness. As suggested by previous literature, the fact that mindfulness is a practice adopted by many individuals, regardless of the existence of psychiatric diagnosis, potentially normalises the process and empowers participants to explore new ways of responding to their experiences, without a focus on deficits or pathology (Davis, Strasburger, and Brown, 2007). Additionally, the safety for this intervention was supported by a lack of reliable or significant deterioration in hallucination symptoms. This is important given early fears for using mindfulness meditation with individuals with psychosis leading to increases in psychosis.

Results on pre-post measures suggest that after completing the iMPV program participants reported their experience of hearing voices was having significantly less negative impact on the mental health and wellbeing. Similarly, findings demonstrated a significant small-to-moderate pre-post reduction in depressive symptoms and voice-related disruption following the intervention. This significant improvement in depressive symptoms supports recent findings from an RCT of Chadwick and
colleagues (2016), looking at group mindfulness for voices. Additionally, this is contrary to a lack of improvement in depressive symptomatology seen in large-scale trials evaluating CBTp for hallucinations (see examples using the Calgary Depression Scale: Birchwood et al., 2014; Trower et al., 2004). The current study failed to identify changes in voice-related distress on the PSYRATS, following the intervention. However, it should be noted that even the largest CBTp study reporting on voice-related distress also failed to find an effect on this measure (Birchwood et al., 2014), raising the possibility of measure insensitivity, given large clinical changes are required to show improvements (Thomas et al., 2014).

In regard to process measure outcomes, large effects were identified for improvements in both mindfulness and attentional switching following the iMPV intervention. These findings suggest that changes in mindful responding, and more specifically an increased ability to not avoid or judge difficult internal experiences, may be a potential mechanism for observed changes in the subjective impact of voice hearing and depression. This is in line with large between-group effects on the SMQ reported by Langer and colleagues (2012) in a recent RCT of group MBCT for psychosis. These findings also suggest that improvements in ability to accurately shift attention from one task to another may also be a potential mechanism of observed symptom change in mindfulness training for voices. Taken together with a lack of observed pre-post changes in sustained attention, this suggests that mindfulness training is teaching individuals to switch their attention more easily between their experiences, rather than to focus on one experience to the exclusion of others (e.g. voice hearing) for long periods of time. Given previous research has identified that individuals who experience hearing voices demonstrate deficits in control over attentional switching, this potential neurocognitive mechanism may be particularly salient for interventions targeting this population (Hugdahl, 2009; Siddi et al., 2017; Waters et al., 2012).

However, it should be noted that the effects on the primary and secondary outcomes and process measures revealed by this study appeared to decrease at two-month follow-up. This suggests that a longer course of mindfulness practice may be required to sustain positive changes to one’s relationship with hearing voices. For instance, in contrast to the advanced clinical skillset required to deliver CBTp, routine
mindfulness boosters delivered post-intervention by a range of allied health workers, including caseworkers may be a pragmatic approach to intervention delivery and continued care.

Limitations and recommendations

Although this study yielded encouraging findings relating to the acceptability, feasibility and potential effects of a new MBI for voices, results are limited to small pre-post comparisons on outcome measures with limited experimental control. Further examination is needed, including more extensive examination of feasibility and acceptability in a larger sample (including of participant recruitment and retention as well as of the intervention). Examination of feasibility can be improved in future trials by setting out feasibility criteria for recruitment, participant retention and intervention engagement. The study design did not test efficacy, which would require a methodologically rigorous, randomised controlled design. Pre- and post-assessments with participants being conducted by the mindfulness therapist may have introduced bias into measures. Although the therapist completed a three-month practitioner training in MBCT, more extensive training and supervision in delivering mindfulness has been recommended by the UK Network for Mindfulness-Based Teachers Good Practice Guidelines for Teaching Mindfulness-Based Courses. Additionally, the therapist was a graduate psychologist undertaking clinical psychology training, so generalisation of the current results to other disciplines cannot be assumed. Given the need for broad dissemination of psychological therapies for psychosis, it is recommended that future research include adequately trained mindfulness therapists from other allied health backgrounds to assess the suitability of this model in clinical practice. In line with much of the literature for therapies for hearing voices, the sample focused on persons with schizophrenia-spectrum disorders, although this was not formally assessed. Generalisation to other voice hearing populations is hence unknown.

Conclusion

This acceptability and feasibility pilot study is the first trial to examine a mindfulness intervention for persistent voices of individual format. Our findings suggest this novel treatment protocol is appropriate, engaging and safe for individuals
experiencing hearing voices. Small-to-moderate effects were revealed for pre-post improvements in the negative impact of voices, depressive symptoms and voice-related disruption. Large effects for changes in process measures of mindful responding and attentional switching accuracy suggest these to be potential mechanisms of change warranting further investigation. Although low levels of methodological control limit these findings, results suggest further large-scale RCTs are warranted to ascertain the efficacy for focussed mindfulness interventions for voices. Such efforts should focus on aiding dissemination in clinical practice by using an individual delivery modality and include other mindfulness therapists in addition to those with clinical psychology training, as previously utilised. Additionally, appropriate outcome measures of voice-related distress and disruption should be carefully considered, as opposed to relying on less sensitive single item measures.

Acknowledgments

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Ethical statements

During this research the authors have abided by the Ethical Principles of Psychologists and Code of Conduct as set out by the APA. Additionally, This research was conducted following ethical approval obtained from The Alfred Hospital Human Research Ethics Committee (138/14) and The Swinburne University of Technology Human Research Ethics Committee (2015/029). All procedures outlined in this article were in accordance with these relevant institutional ethics committee clearances and the Declaration of Helsinki.

Conflict of interests

The authors have no conflict of interest with respect to this publication.
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CHAPTER 7: DISCUSSION
CHAPTER 7: DISCUSSION

7.1 Chapter Guide

The overarching research goal of this thesis was to empirically test the use of mindfulness as a therapeutic tool for managing the distress and disruption associated with psychotic symptoms, specifically distressing voices. It was hoped this research would provide a substantial contribution to the scientific literature by addressing gaps relating to the understanding of the role of mindfulness in the treatment of psychosis, particularly with regard to hearing voices. To guide this dissertation in addressing the larger thesis goal, three empirical studies were conducted to address four specific research aims. These research aims were to; 1) determine the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis, 2) establish whether mindfulness is associated with better adaptation to the experience of hearing voices, 3) develop an individual mindfulness-based protocol for distressing voices and examine the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers, and 4) obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention.

The general discussion presented in the following chapter provides an overview and synthesis of the findings from each of the three empirical studies. In comparison with the discussions presented in each of the empirical papers, the aim of this general discussion is to consider study findings in regard to the specific research aims and overall thesis goal. Subsequently, this general discussion will highlight the potential implications of the results in relation to the research field and clinical practice. Limitations of the empirical papers and overall thesis are discussed and directions for future research explored. Lastly, a summary of the thesis findings is presented at the conclusion of this discussion chapter.
7.2 Overview of Main Findings

This thesis examined the efficacy for the use of third-wave interventions for the treatment of psychosis, the relationship between trait-mindfulness and the negative impacts associated with distressing voices, and the feasibility and potential effectiveness of an individual mindfulness protocol (iMPV) for persistent voices. To address each of the specific research aims outlined in Chapter 2, the following sections synthesise the major research findings emerging out of the three empirical studies.

7.2.1 Findings Relating to Research Aim 1

Research aim 1 of this thesis was to determine the efficacy of third-wave interventions, with a focus on mindfulness and acceptance, for the treatment of psychosis. Study 1 (Chapter 4) was specifically designed to address this research aim. In doing so, this study involved conducting an updated and comprehensive meta-analysis of RCTs of third-wave interventions for psychosis. The findings indicated these approaches to be efficacious for reducing overall psychotic symptoms, with significant small-to-moderate between group post-intervention effects revealed. This identified treatment effect supports the findings of previous meta-analyses in this field (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013) that found small-to-moderate treatment effects on positive psychotic symptoms. Furthermore, this treatment effect, revealed by the results of study 1, is comparable to that reported in past meta-analyses of CBTp (Jauhar et al., 2014; Wykes et al., 2008). Given CBTp is the recommended therapeutic approach for psychosis in clinical practice guidelines, these results for third-wave interventions are encouraging. It should be noted that in relation to the primary outcome, effect sizes were smaller and no longer reached significance when examining studies that utilised an active control group only, suggesting the influence of non-specific effects. Therefore, caution should be taken when drawing inferences from current results, as it cannot be concluded observed effects are anything beyond the addition of therapy to routine care.

Furthermore, when studies were looked at by treatment protocol, the post-treatment effect on psychotic symptoms maintained only for MBIs, with ACT trials demonstrating negligible, non-significant effects. These results pose the question of
whether ACT is relatively less effective than focused MBIs for individuals with psychosis. This would be consistent with the observed changes on measures of mindfulness but not of acceptance, suggesting improved mindfulness may be a mechanism of change in third-wave approaches. Given the complexity of ACT as a multicomponent approach, it is possible that a simpler and more focused intervention such as mindfulness is more appropriate, particularly given a heavy reliance on metaphors used in ACT and known impairments in grasping the abstract meaning of proverbs and figurative expressions for people with psychosis (Mossaheb et al., 2014). Conversely, when considering differences between ACT and MBIs, it is important to remember the theory behind third wave interventions is to alleviate distress associated with symptoms, rather than to reduce these psychotic experiences. In line with this, results indicated that third wave interventions are effective for reducing depressive symptoms in the context of psychosis. This finding is inconsistent with the post-treatment effects on affective symptoms reported in previous meta-analyses (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013). It should be noted that the analysis by Cramer and colleagues (2016) only included ACT trials, whereas the analysis in study 1 included trials of mindfulness-, acceptance- and compassion-based interventions. This finding is of particular importance in psychosis given the high rates of comorbid depressive symptoms experienced by individuals and the potential implications of depression on positive psychotic symptoms (B. Smith et al., 2006).

Study 1 failed to find significant differences for positive and negative psychotic symptoms. These results differ from findings from previous meta-analyses that identified between-group treatment effects on positive (Cramer et al., 2016) and negative (Khoury, Lecomte, Gaudiano, et al., 2013) psychotic symptoms. In explaining this, it is notable that only one MBI was included in the analysis by Cramer and colleagues (2016) and there were limited studies included in the analysis of Khoury and colleagues (3; 2013), which may account for discrepancies between current and past results. This leads to some questioning of the specific effect of focused mindfulness interventions on positive psychotic symptoms. Similarly, no differences in hallucination-related distress were observed in study 1. However, previous literature has suggested that as large clinical changes are required to show improvements on the
PSYRATS, null findings may be due to measure insensitivity rather than unchanged patterns of symptom-related distress (Birchwood et al., 2014; Thomas, 2014).

As an address to research aim 1, it was concluded that interventions founded on mindfulness principles such as non-judgemental and self-compassionate awareness and acceptance of symptoms, appear to be beneficial for the treatment of psychosis. In the sense that they demonstrate adequate treatment effects on psychotic symptoms. However, if one is to keep in mind the premise behind such approaches, further trials considering outcomes on the emotional and functioning impacts of psychosis are required to aid in a deeper understanding of how engagement in such interventions translates into impact within the daily lives of those experiencing psychosis.

### 7.2.2 Findings Relating to Research Aim 2

Research aim 2 of this thesis was to establish whether mindfulness is associated with better adaptation to the experience of hearing voices. Study 2 was specifically designed to address this research aim. Past research has proposed mindfulness to be efficacious for the treatment of psychotic symptoms. Additionally, previous literature has suggested several theoretical benefits for the use of mindfulness for distressing voices and identified preliminary evidence through cross-sectional studies. Despite this, more empirical research was needed to ascertain whether mindfulness is linked with better management of the negative impacts associated with the experience of hearing voices. This gap in the literature was addressed by exploring the links between mindful relating to voices and voice-related distress and disruption, and resistant responding, which are commonly targeted by psychological interventions.

The results from study 2 suggested that mindfully relating to voices was linked to lower levels of voice-related distress. That is, less intense and less frequent feelings of distress when hearing voices. Additionally, results indicated the more individuals were able to be mindful of their voices, the less they avoided and struggled against them (or vice versa). This was observed as a decrease in emotional and behavioural resistance. When explored further, findings suggested that when related voice topography (frequency, duration, or loudness) and mood symptoms (depression or anxiety) were controlled for, the amount individuals were able to mindfully relate to
their voices explained a significant proportion of variance in the negative impacts associated with hearing voices. Specifically, the intensity and frequency of distress experienced when hearing voices and the level at which individuals responded to the experience with resistance. Further, mindfulness of voices predicted not only emotional and behavioural resistance combined, but when the items relating to emotional distress were removed, mindful responding also predicted the level of resistant behaviours individuals employed, in response to their voices.

These results were in line with previous findings that identified mindfulness of voices was negatively related to voice-related distress (Chadwick et al., 2007; Úbeda-Gómez et al., 2015) and resistance to voices (Chadwick et al., 2007; E. Morris et al., 2014). The findings from study 2 extend results of Chadwick and colleagues (2007) as regression analyses provided further information regarding the amount of variance accounted for after controlling for confounding variables relating to voice topography and mood. Also, compared with these past results, current findings provided additional information regarding the impact on resistant responding to voices after removing items relating to emotional distress, which are likely to relate to voice-related distress. Previous literature has mostly explored relationships between general trait mindfulness, rather than mindful relating to voices specifically, and negative impacts of voice hearing (e.g. E. Morris et al., 2014; Perona-Garcelán et al., 2016; Úbeda-Gómez et al., 2015). Comparatively, the findings from study 2 provided insight into whether mindfulness of voices is related to better adaptation to the experience and results suggest that teaching people how to relate mindfully to their voices may be a key treatment target of psychological therapies for persistent voices.

Despite these promising findings, results from study 2 indicated the amount people mindfully related to voices was not linked with, and did not, predict the extent that voices disrupted their day-to-day functioning: that is, relationships with family and friends, self-care, and independent living. Therefore, although mindful responding to voices appears to be associated with decreased levels of the emotional distress associated with the experience, this does not seem to have an impact on an individual’s level of social and occupational functioning. This result is in line with previous
literature; however, it is important to mention that this relationship has only been explored by one other study (see E. Morris et al., 2014).

As a response to research aim 2, together these results suggest that mindfulness utilised as a response to voice hearing predicts better adaption to the levels of distress specifically associated with the experience. It also appears to be associated with less resistance of voices a behaviour frequently engaged in by voice-hearers that may be less adaptive.

7.2.3 Findings Relating to Research Aim 3

Although third-wave interventions have demonstrated efficacy for the treatment of psychosis, only one RCT has examined a mindfulness-based protocol for persistent voices. Cross-sectional findings suggest interventions that target one’s relationship with, and response to, psychotic symptoms would theoretically be of benefit for the treatment of the distress and negative impact associated with hearing persistent voices. However, the development, implementation and evaluation of further mindfulness-based trials applying protocols for, and considering outcomes on, persistent voices was required. Research aim 3 of this thesis was to develop an individual mindfulness-based protocol for distressing voices and examine the acceptability, feasibility and potential effectiveness of this intervention, with persistent voice-hearers. Study 3 was designed to address this research aim by developing a focused, individual mindfulness intervention for persistent voices and examining effects on the negative impacts of and distress related to these psychotic symptoms. Findings from study 3 implied the individual Mindfulness Program for Voices (iMPV), that was described in the empirical paper, is acceptable and feasible for individuals with persistent voices. Results indicated there were low levels of participant attrition, good attendance rates for the four sessions and high in-session and at-home engagement in formal mindfulness practice. These findings, with the addition of positive participant feedback, suggested voice hearers are capable of, and see value in, completing mindfulness training. Furthermore, a lack of reliable or significant findings for a deterioration in auditory hallucinations suggest this intervention protocol may be safe for people with psychosis. However, further large-scale controlled trials are required to determine this. These results are consistent with
previous findings of MBIs for distressing voices (Chadwick et al., 2016) and for psychosis more generally (Cramer et al., 2016) that have proposed mindfulness to be ‘safe and therapeutic’ for individuals to engage in. These findings also add to a large body of literature discounting initial concerns regarding the use of meditation practices with people with psychosis (Deatherage, 1975; Yorston, 2001).

Results from study 3 on pre-post measures indicate that following the iMPV program, hearing voices had significantly less of a negative impact on participant’s mental health and wellbeing. Outcomes assessing the subjective impact of voices on such domains of experience have not been explored in previous trials of MBIs for psychosis. Given the SEPS measure was designed in consultation with consumers, this a particularly noteworthy finding pertaining to the practical implications for this intervention (Haddock et al., 2011). Likewise, it was revealed that after the intervention the experience of hearing voices disrupted individual’s social and occupational functioning significantly less. This finding was especially novel for the field, given outcomes of symptom-specific (voice-related) disruption to everyday functioning has not been reported by previous trials of MBIs for psychosis (Louise, Fitzpatrick, Strauss, Rossell, & Thomas, 2017).

Participants also experienced a significant decrease in overall distress after the intervention, specifically in relation to depressive symptoms. This significant improvement in depressive symptoms is consistent with recent findings of Chadwick and colleagues (2016) who identified reductions in depression following group mindfulness for voices. However, no significant changes in symptom-specific distress were noted. This finding differs from previous results of Chadwick and colleagues (2016) who identified a significant reduction in voice-related distress following a course of PBCT. It should be noted, results from study 3 did reveal a strong trend for a reduction in the amount of distress related to voices experienced by participants following the intervention ($z = -1.78, p = .075$), suggesting results were perhaps due to a lack of statistical power rather than a true null finding.

Findings also identified there were no significant post-treatment changes in voice topography (frequency, duration, loudness). This suggested that a reduction in the
occurrence and intensity of symptoms was not necessary to see aforementioned changes in the subjective emotional and functional impacts of hearing voices, voice-related disruption to social and occupational functioning, or depression. This finding is in line with the principals and foundations of mindfulness approaches that attempt to alleviate distress and disruption associated with symptoms, rather than to reduce or eliminate such symptoms.

In response to research aim 3, together these findings indicated the innovative mindfulness intervention for voices described in study 3 is safe, suitable and practical for people who experience hearing persistent voices. That is, these individuals are capable of, and satisfied with, learning mindfulness. These results suggest the iMPV intervention is beneficial for reducing the emotional and functioning impact of hearing voices.

7.2.4 Findings Relating to Research Aim 4

Past research has highlighted the need for further exploration of the key processes involved in mindfulness-based trials applying protocols for persistent voices that are vital for clinical change. Research aim 4 of this thesis was to obtain further information on potential psychological and neurocognitive mechanisms of change, specifically mindfulness and attention. Study 3 was designed specifically to address this research aim. Findings suggested that following the iMPV program, there was a large and significant increase in the amount participants employed mindfulness skills when relating to distressing internal experiences (thoughts and images). That is, how often they were able to respond to such experiences with non-judgemental awareness and acceptance. This is consistent with previous findings that identified large between-group effects for mindfulness of thoughts and images, following group-format mindfulness (Chadwick et al., 2009a; Langer et al., 2012). Our results also indicated that after the mindfulness intervention, there was a large and significant improvement in individuals’ ability to accurately switch their attention between tasks. This finding is consistent with previous literature that has identified that even in the short-term, mindfulness training, can improve attentional control or switching (Jha et al., 2007; Tang et al., 2007).
However, study 3 was the first trial of an MBI for psychosis and more specifically, for voices, that has investigated outcomes of attention.

In addressing research aim 4, these findings implicate the process of mindfully relating to distressing experiences as a potential psychological mechanism involved in the observed post-treatment changes in the specific impact and overall distress associated with hearing voices. Similarly, the ability to accurately switch one’s attention from one task to another may be a vital neurocognitive mechanism for observed symptom changes in this mindfulness intervention. It was concluded these potential mechanisms underlying observed therapeutic change warrant further investigation as possible treatment targets for psychological interventions for persistent voices.

7.3 Synthesis of Findings in Relation to the Overarching Thesis Goal

The overarching research goal of this thesis was to empirically test the use of mindfulness as a therapeutic tool for managing the distress and disruption associated with psychotic symptoms, specifically distressing voices. The three empirical studies included within this dissertation have contributed to, and extended, the existing scientific literature in a number of important ways. For instance, the findings in relation to research aim 1 suggest that third-wave interventions, with a focus on mindfulness and acceptance, appear to be effective for reducing psychotic symptoms and depressive symptoms in the context of psychosis, with mindfulness being implicated as a potential mechanism of clinical change. Thus, providing evidence that third-wave interventions, including focused mindfulness approaches, may be safe and clinically beneficial therapeutic tools for use with those experiencing psychosis.

The thesis built upon these findings with research aim 2, by extending our theoretical understanding of how trait mindfulness may assist individuals adapt to the experience of hearing voices. These findings provided evidence to suggest that one’s relationship with, and responses to, distressing voices may be relevant treatment targets for psychological interventions. The data presented provided important empirical evidence to suggest that mindful relating to voices may be useful in managing the distress and disruption associated with the experience. This thesis then extended these findings through research aim 3, by developing and piloting an individual mindfulness-
based protocol for persistent voices. The piloting of this program provided further evidence for the acceptability, feasibility and effectiveness of focused mindfulness approaches designed to help people to manage the subjective impact and distress associated with hearing voices. The results also provided support for the development and evaluation of brief mindfulness interventions delivered in individual format. Furthermore, the findings of research aim 4 extended our understanding in relation to how such focused mindfulness interventions may be assisting clients, by identifying mindful relating and attentional switching as potential mechanisms for observed clinical change. These are important findings as they provide us with a deeper understanding of the psychological and neurocognitive mechanisms of change that may underlie the effectiveness of MBIs for persistent voices warranting further investigation.

When considered collectively in relation to the overarching thesis goal, the overall findings suggest that mindfulness may in fact be a useful therapeutic tool capable of assisting clients to better manage the distress and disruption associated with psychotic symptoms, specifically distressing voices. The findings however, go beyond that of the overarching thesis goal, by implicating mindful relating and attentional switching as potential mechanisms of change involved in such mindfulness approaches.

7.4 Significant Implications

The overall thesis findings have several significant theoretical and applied implications that span across numerous domains. The following sections will discuss these implications in relation to both research and clinical practice.

7.4.1 Theoretical Implication and Future Directions for Research

7.4.1.1 Focussed mindfulness-based interventions

Mindfulness has commonly been included as a small element of broad multi-component protocols, such as ACT, with formal mindfulness practice usually being encouraged but optional and not a core component of the intervention (C. Strauss et al., 2015). When findings from the meta-analysis in study 1 were looked at by treatment protocol, the observed treatment effect on psychotic symptoms seemed to be specific to the MBIs, with ACT trials demonstrating negligible, non-significant effects. In regard to
the process measures considered in studies 1 and 3, between- and within-group changes were noted on measures of mindfulness but not of acceptance. Overall, these results pose the question of whether ACT may be relatively less effective than focused mindfulness approaches, in which formal mindfulness practice is a foundation of therapy.

Considering the overall findings of this thesis, a few theoretical explanations for these results are proposed. Firstly, it could be that the technology of ACT is less potent than a more focused mindfulness intervention. It is notable that ACT differs by having quite broad variety of components that for some client groups may be less powerful in promoting change than learning a single more focused skill. This may be particularly the case with a client group that, on average, has greater difficulties with executive function, and memory than other mental health populations (Hugdahl, 2009; Mossaheb et al., 2014; Siddi et al., 2017). Indeed, there have been some suggestions in the literature that persons with psychosis can have difficulties with some of the abstract metaphors and experiential exercises used in ACT (Bacon, Farhall, & Fossey, 2014; Shawyer et al., 2016) and that outcome may be related to indices of cognitive functioning. Secondly, the benefits to mechanisms such as attention processes identified in study 3, that appear specific to the formal mindfulness practices often included as a fundamental component in MBIs are particularly useful for individuals with psychosis. Past research has also identified improvements in attentional switching following mindfulness training (Jha et al., 2007; Tang et al., 2007). Lastly, the difference in intervention format (individual versus group) between ACT and MBIs is resulting in large non-specific effects on outcome measures. However, previous literature has identified an increase in observed treatment effects when other interventions have been delivered in individual format (e.g. CBTp; van der Gaag et al., 2014). Considering these previous findings within the extant literature, it appears likely that both explanations 1 and 2 may be contributing to the observed differences in effects between treatment protocols. Therefore, it is recommended that future research further evaluate focused mindfulness interventions for psychosis in individual format, as to control for the non-specific effects of group therapy. Future studies should assess the feasibility for more rigorous randomised and controlled trials.
7.4.1.2 Symptom-specific protocols

Findings from the systematic search in study 1 revealed that only one RCT of a third-wave intervention for psychosis utilised a symptom-specific protocol (see Chadwick et al., 2016). Hence, research aim 3 of this thesis was to develop and evaluate a mindfulness protocol for persistent voice-hearers. Pre-post results from study 3 extended previous literature by providing promise for the feasibility and effectiveness for such symptom specific approaches on the distress and subjective functional impact often associated with hearing voices. This has several implications for future research, as it has been proposed that by reducing the confounds of other therapeutic processes, targeted interventions may allow for increased precision in investigating the efficacy for, and potential mechanisms of change involved in MBIs for psychosis (C. Strauss et al., 2015). As the interventionist-causal model suggests, by focussing on individual symptoms the heterogeneity of psychosis is significantly reduced (Freeman, 2011). This paradigm has been applied to other symptoms of psychosis (e.g., delusions), and has resulted in the development of more targeted psychological therapy protocols (Farrelly et al., 2016; Freeman, 2011). It is recommended that future research develop further third-wave approaches that target specific symptoms of psychosis, specifically distressing voices.

7.4.1.3 The relationship between mindfulness and depressive symptoms in psychosis

Findings from study 1 identified moderate and significant effects of third-wave interventions on depressive symptoms, in individuals with psychosis. This extended on previous meta-analytic findings of Khoury and colleagues (2013), who only identified significant treatment effects on affective symptoms, in a within-groups analysis and failed to replicate these findings when outcomes were examined between-groups. However, this finding was consistent with meta-analytic results of mindfulness for depression in community samples (Khoury, Lecomte, Fortin, et al., 2013). Study 3 further supported the findings from study 1, with a small-to-moderate, significant post-treatment effect for an improvement in depressive symptoms being identified, following the iMPV program for persistent voices. These results also supported recent findings
from Chadwick and colleagues (2016) who identified a significant improvement in depressive symptoms following group mindfulness for distressing voices.

These findings from studies 1 and 2 have significant implications for future research as they demonstrate improvements in depressive symptomatology in persons with psychosis and specifically with persisting hallucinations, following psychological therapy. This is contrary to a lack of improvement in depression seen in large-scale trials of CBTp for hallucinations (Birchwood et al., 2014; Trower et al., 2004). Such findings are particularly important for people with psychosis given the high prevalence rates of depressive symptoms, and their negative impact on quality of life (B. Smith et al., 2006). However, it should be noted that only three studies included in the meta-analysis in study 1 considered outcomes on depressive symptoms (Braehler et al., 2013; Chadwick et al., 2016; White et al., 2011), and only one of these trials utilised a mindfulness-based protocol (Chadwick et al., 2016). The piloting of third-wave approaches (ACT) targeting depression following psychosis have recently begun (e.g. ADAPT; Gumley et al., 2016). Preliminary findings for this trial have suggested the ACT for depression after psychosis (ACTdp) intervention was ‘well tolerated’ by participants with low rates of non-attendance and attrition (Gumley et al., 2017). Additionally, significant differences for changes in self-reported depressive symptoms were identified following the intervention, with ACTdp participants demonstrating significant reductions in depression compared with controls (Gumley et al., 2017). Given the strong origins of mindfulness for the treatment of depression in community samples and the encouraging findings of studies 1 and 3, it is recommended that future research also evaluate the benefits of mindfulness-based approaches on depressive symptoms in the context of psychosis.

### 7.4.1.4 The relationship between mindfulness and voice-related disruption

Findings from study 2 indicated that although mindfulness may be associated with less distress associated with the voice-hearing experience, this finding was not related to an impact on their functioning. This was in line with previous cross-sectional research that failed to find a relationship between mindfulness and voice-related disruption (E. Morris et al., 2014). It was concluded that perhaps MBIs for persistent
voices should be complement to more specific rehabilitative approaches. However, these results were inconsistent with pre-post findings from study 3, which identified a moderate and significant treatment effect of the iMPV program on voice-related disruption. This suggests that perhaps a mechanism other than mindfulness may be influencing this symptom-specific level of functioning and raises the question of whether there is perhaps something specific about formal mindfulness practice that improves the functional impairments often associated with hearing voices that is not found in trait mindfulness.

From a theoretical perspective, one potential explanation may be the benefits of attention training. It is feasible the identified positive impacts of mindfulness-training on attention (Jha et al., 2007; Tang et al., 2007) could be at least partly responsible for the notable improvements in symptom-related disruption to functioning. Previous research has proposed that voice-hearers allocate increased attentional resources on the experience and have less control over their ability to switch their attention from the experience to other tasks at hand (Hugdahl, 2009; Waters et al., 2012). Therefore, perhaps individuals developing greater control over their attention following mindfulness-training translates to them having more attentional resources to allocate to other areas of everyday functioning. For example, voices may have less ‘attentional pull’ over individuals whilst they are conversing with friends or family. Large and significant post-treatment effects of the iMPV program on attentional switching revealed in study 3 support this proposition and suggest this might be one neurocognitive mechanism that warrants further examination by future research.

7.4.1.5 Outcome measures for third-wave interventions

Findings from the overall dissertation have several implications for future research. For instance, during the data collection phase for study 1, it was identified that few studies reported outcomes on the specific goals of third-wave approaches such as symptom-related distress and disruption to functioning (e.g. Chadwick et al., 2016; Shawyer et al., 2012; Shawyer et al., 2016). Consequently, the primary outcome chosen for study 1 was the presence and severity of psychotic symptoms. However, this provided a relatively indirect measure of the intended outcomes of psychological
interventions for psychosis. Study 1 further highlighted issues with the appropriateness of previous literature’s strong focus on symptom reduction in trials of third-wave interventions for psychosis and a lack of consensus for outcome measurement (Thomas, 2015a). Outcome measures utilised in study 3 were chosen with these concerns in mind and assessed effects of the intervention on the subjective impact of hearing voices, overall distress, voices-related distress and disruption. Despite careful consideration during this measure selection process, interpretation of the findings of studies 1 and 3 were limited by potential measure insensitivity of the widely used PSYRATS items that index symptom-related distress and disruption to functioning (Thomas, Hayward, Strauss, et al., 2014). Overall this methodological issue encountered highlights the need for future research to develop and validate more appropriate outcome measures for trials of third-wave approaches for psychosis. It is suggested that measures are in line with third-wave aims and focus on the emotional and functional impact of psychotic experiences, rather than symptom reduction. To ensure assessed outcomes are appropriate and relevant for individuals with psychosis, it may be beneficial for measures to be designed and validated in conjunction with consumers. The utility of this model has been previously supported by the development of the SEPS, the primary outcome measure employed in study 3 (Haddock et al., 2011), and further efforts are currently underway at the University of Sussex (the Voices Impact Scale; C. Strauss, 2016).

7.4.2 Implications for Clinical Practice

7.4.2.1 Implications relating to iMPV program content

Acceptability of mindfulness in psychosis

Previous literature has proposed that given mindfulness is a practice implemented by many individuals, regardless of the existence of psychiatric symptoms or diagnosis, this potentially normalises the process (Davis, Strasburger, & Brown, 2007). Furthermore, it has been suggested this normalisation may empower participants to explore new ways of responding to their experiences, without a focus on deficits or psychopathology (Davis et al., 2007). Acceptability and feasibility findings from study 3, which found high levels of in session and out of session engagement and positive
participant feedback, indicated that participants were not only able to engage in mindfulness practices but that they actually enjoyed learning mindfulness. This is consistent with the qualitative feedback from a large ACT trial in which participants specifically mentioned the acceptability and perceived benefits of mindfulness training (Bacon, Farhall, & Fossey, 2014). Findings from study 3 have important practical implications as they suggest mindfulness to be a potentially therapeutic tool for psychosis, that consumers perceive in a positive light and are likely to engage in. This is particularly important given consumer attitudes toward treatments for psychosis (e.g. antipsychotic medication) have been found to negatively impact rates of adherence and positive attitudes toward intervention have been linked with improved outcomes and better prognosis (Mohamed et al., 2008).

The safety of formal mindfulness meditation in psychosis

Findings from study 1 indicated that third-wave interventions were effective for reducing psychotic symptoms. When examined by treatment protocol, this treatment effect appeared to be specific to mindfulness-based approaches, which demonstrated moderate and significant effects for post-treatment reductions in psychotic symptoms. It is important to note that the mindfulness interventions incorporated in this analysis included formal mindfulness practices as part of the prescribed session content and home meditation practice was usually encouraged and facilitated through the provision of audio files of guided exercises. Findings from study 3 revealed a lack of reliable change or significant results for a deterioration in auditory hallucinations, following participants engagement in an MBI for persistent voices. As described in Chapters 3 and 6 of this thesis, as this was a focussed mindfulness intervention, rather than part of a multi-component approach, formal mindfulness practice was a large part of the weekly session content. Daily meditation practice was encouraged and home practice records indicated that participants engaged in large amounts of formal mindfulness practice between sessions.

Collectively, the findings from studies 1 and 3, which revealed a lack of exacerbation in psychotic symptom following engagement with formal mindfulness practice, further support recent literature suggesting mindfulness to be safe for people.
with psychosis (Cramer et al., 2016; Khoury, Lecomte, Gaudiano, et al., 2013), and specifically for individuals with distressing voices (Chadwick et al., 2016). Given initial concerns for people with psychosis engaging in mindfulness meditation practice (Deatherage, 1975; Yorston, 2001), these findings have significant implications for clinical practice. They suggest that when adaptations are employed, such as ensuring formal practices are less than 15 minutes long and avoiding long periods of silence during exercises, mindfulness is an appropriate therapeutic tool for clinicians to use with individuals with psychosis. Given, psychological therapy is a relatively small component in the treatment of psychosis in most community health settings, findings from the current thesis provide support for alternative approaches to standard antipsychotic medication.

**Discussing and utilising voice content and themes in therapy**

Traditionally, mental health workers have been of the opinion that discussing the meaning and content of voices during the provision of care to individuals with psychosis can be detrimental to recovery (Coffey & Hewitt, 2008). There has been a large emphasis placed on antipsychotic mediation and the role of counselling has been limited and if provided usually consists of general discussions rather than specifics of the voice-hearing experience (Coffey & Hewitt, 2008). Mental health workers have voiced concerns about providing attention to or focusing on voice content for a fear of exacerbating such positive symptoms (Coffey & Hewitt, 2008). Study 3 involved the development of a mindfulness approach that not only discussed voices, their content and meaning, but also utilised themes of and specific content during formal mindfulness practices. When developing this program, it was noted that people often experience a decrease in the frequency of their voices in therapy sessions and specifically during mindfulness practices. Individuals report the specific content of their voices to be personalised and emotionally distressing. Therefore, it was decided that for participants to be able to effectively practice mindfully responding to voices, the phenomenology, meaning and associated distress associated with the experience should be replicated, to the extent possible. Consequently, specific voice content was recorded on a voice loop application and played during mindfulness practices in sessions three and four of the
iMPV program. However, participants were instructed to choose voice content for use in sessions that was only mildly emotionally activating, as to avoid undue distress.

As mentioned above, findings from study 3 indicated there was a lack of deterioration in symptoms of auditory hallucinations for participants, following the iMPV intervention. Additionally, small-to-moderate and significant treatment effects for a reduction in the emotional and functional impacts associated with voices were also observed. These results imply that discussions about the meaning and content of voices and the utilisation of such content during experiential activities are safe and therapeutic for individuals with psychosis. From a clinical perspective, this provides further support for the role of psychological interventions in the management of psychosis and persistent voices and should allay fears that mental health workers may have when working with this population.

**The use of technology to overcome barriers to engagement**

As mentioned in Chapter 6, the iMPV program that was developed in study 3 utilised technology in an attempt to overcome barriers for participant’s engagement with home mindfulness practice. This was done so through the provision of audio files of guided mindfulness practices installed on a battery-operated MP3 player. It was expected that this device would overcome issues that have been known to arise when using audio CDs with this sample. For example, the lack of availability of CD players or players located in common areas of residential housing, and an inability for participants to participate in practices outside of the home. Findings from study 3 indicated that participants engaged in high levels of formal mindfulness practices between iMPV sessions. These results have significant implications for clinical practice, as they emphasise the importance for clinicians to identify methods, outside of common therapeutic practices, to help individuals to engage more readily with therapy. Current findings provide further support to an increasing body of literature demonstrating benefits for the use of technology-enhanced mental health care within the context of psychosis (Firth et al., 2015).
CHAPTER 7: DISCUSSION

Providing an alternate relationship with symptoms

With early roots in ancient Buddhism, mindfulness approaches are based on the premise that distress is the result of how a person perceives and responds to an experience or sensation, rather than a consequence of the event itself (Kabat-Zinn, 1994). It has been suggested that by increasing mindful awareness of present moment experiences, with an attitude of non-judgemental acceptance, distress will be alleviated (Kabat-Zinn, 1994). Theoretically, this process provides individuals with psychosis with an alternate relationship with symptoms, as opposed with attempts to eliminate them or change their frequency (Abba et al., 2008). Findings from study 3, which identified a lack of significant post-treatment changes in voice topography (frequency, duration, loudness), indicated that a reduction in the occurrence and intensity of symptoms was not required to see changes in the subjective emotional and functional impacts (identified as particularly salient to consumers; SEPS) of hearing voices. These results have important practical implications, as they suggest that mindful observation and acceptance of psychotic experiences such as voices may help individuals to better manage the experience, with less emotional, social and functional impairment and lead happier and more fulfilled lives. This is in line with past literature that suggests that mindful-acceptance of psychotic symptoms and the self, helps individuals to reclaim power over such experiences, which is key in reforming one’s identity outside of psychosis (Goodliffe et al., 2010).

7.4.2.2 Addressing dissemination issues of interventions for psychosis

Therapeutic skill

Despite being the recommended treatment for psychosis, recent literature has emphasised issues with the dissemination of CBTp in clinical practice (Thomas, 2015b). One such issues that has been highlighted by previous literature is that delivery of formulation-based multi-component approaches such as CBTp or ACT require an advanced level of therapeutic skill (Farhall & Thomas, 2013). Given there is a lack of training in psychological interventions for psychosis for mental health professionals, this precludes a significant number of workers from delivering such approaches and likely restricts service provision (Farhall & Thomas, 2013). It has been suggested that
more focused psychological interventions such as those comprising manualised mindfulness training, may be simpler to disseminate within current mental health models (Thomas, Hayward, Peters, et al., 2014). However, it should be noted that despite difficulties regarding dissemination formulation-based approaches such as CBTp demonstrate clear benefits for the treatment of psychosis (Marcus & Cather, 2015). The ability to individually tailor this approach is particularly useful considering the heterogeneous nature of the voice-hearing experience (Marcus & Cather, 2015). There is also added benefit of focusing on the ‘individual clinical priorities’ in that clients often feel there is a greater understanding of their complex needs (Marcus & Cather, 2015). In practice, it is hoped that manualised MBIs for psychosis are delivered alongside these current formulation-based interventions and provide clients with another, more accessible, alternative to standard care.

Findings from the overall thesis suggest that mindfulness may help people to better manage the experience of psychotic symptoms. Specifically, results from studies 1 and 3 indicate that focused mindfulness interventions may be particularly beneficial for individuals with psychosis. Given the proposed benefits regarding delivery of such approaches, these results have important implications for clinical practice. Particularly, as with the appropriate training, such focused manualised mindfulness approaches may be delivered by a range of allied health workers further to exclusively clinical psychologists, as is often the case with CBTp. However, practitioners will need to have a high level of training in mindfulness, as the delivery of mindfulness interventions requires both the completion of comprehensive training programs and a developed mindfulness practice (Crane, Kuyken, et al., 2012). For instance, to assist in the development and delivery of the iMPV program, the candidate undertook significant training in mindfulness. It is important that the increased popularity of MBIs within mental health settings does not undermine the treatment integrity, fidelity or competence levels of mindfulness practitioners (Crane, Kuyken, et al., 2012). Ideally, clinicians should be trained, and have their competencies assessed, by experienced mindfulness teachers for quality assurance (e.g. MBI-TAC; Crane, Soulsby, et al., 2012). Nevertheless, the wide popularity and subsequent increased training in mindfulness-based approaches suggests there may be more practitioners available with
a background in mindfulness than practitioners with skills in CBTp. This could have significant impacts on identified dissemination issues for psychological therapies in psychosis.

**Individual format**

During the systematic search conducted in study 1, it was identified there were no controlled trials in the existing literature that had examined the effects of a MBI for psychosis in individual format. Current public health care systems (e.g. Australia’s Medicare system) make the funding of group programs difficult, and in practice, psychological therapies for people with psychosis are typically delivered one-to-one. Therefore, it is imperative that research be pragmatic in its attempts to establish and evaluate the effectiveness for treatments for psychosis to facilitate adequate levels of dissemination. Furthermore, given voice hearing and psychotic phenomenology present heterogeneously, it is possible the development and evaluation of MBIs of individual format may see an increase in the observed treatment effects, similar to those seen in individually administered CBTp (van der Gaag et al., 2014). The delivery of interventions in group format has often been perceived as a more cost-effective approach for psychological therapies, with MBCT being developed as a classroom-based program for this very reason (Ma & Teasdale, 2004). However, recent literature has suggested the calculation for such economic factors to be flawed (Tucker & Oei, 2007). For instance, inconsistency in cost calculation strategies and an inadequate number of studies reporting costs for specific disorders has been identified by past research (Tucker & Oei, 2007). In a review of the cost-effectiveness of individual versus group CBT, Tucker and Oei (2007) suggested that treatment efficacy is the primary contributing factor that should be considered in regard to delivery modality, as ineffective interventions often result in additional service contacts. Further studies evaluating MBIs for psychosis of individual format are therefore required to determine differences in treatment effects and subsequent cost-effectiveness of these approaches.

Study 3 involved the development of such a one-to-one mindfulness-based approach, the iMPV program. Findings from this study indicated this novel protocol to be acceptable and feasible for people who experience hearing persistent voices. This
could have important implications for clinical practice, as the availability of further psychological interventions for psychosis that work well within current mental health service frameworks may assist in more widespread dissemination. Additionally, protocols such as the iMPV program that are manualised and able to be delivered individually may provide an additional tool for clinicians currently working with people with psychosis.

**Intervention length**

The iMPV program that was developed was relatively brief in nature, comprising a total of four one-hour sessions. The development of a program of this duration and format has significant implications for clinical practice. There are several mental health settings that preclude clinicians from engaging in lengthy therapeutic protocols. For example, due to available resources, many public outpatient services, inpatient psychiatric units, and correctional facilities are only able to offer consumers a limited number of sessions with a psychologist. Similarly, public health care systems such as Australia’s Medicare system, provide rebate for six psychology sessions per calendar year (with an additional four, dependent upon review). The acceptability, feasibility and positive post-treatment effects on the emotional and functional impacts associated with hearing voices, revealed in study 3 provide support for this brief therapeutic approach.

However, it should be noted that these treatment-effects on the primary and secondary outcomes and process measures seemed to decrease at two-month follow-up. Although definitive conclusions cannot be drawn due to the pre-post design of this study, these findings may suggest that a longer course of mindfulness practice could be necessary to sustain the observed positive changes to the distress and disruption often linked with hearing voices. This poses the question of what such a course may look like. For instance, higher intensity mindfulness-based approaches such as MBCT that include eight or more sessions have demonstrated feasibility and efficacy for individuals with psychosis (Langer et al., 2012). However, these follow-up results from study 3 do not necessarily suggest that participants were not able to learn how to mindfully relate to voices within four sessions, but instead that perhaps they require additional support to
maintain a routine mindfulness practice. In contrast to the high level of clinical skill required to deliver CBTp, routine mindfulness boosters could be delivered following the intervention by a range of allied health workers (e.g. caseworkers), provided they complete adequate mindfulness training programs. This may be a pragmatic approach to intervention delivery and would fit into current models of continued care.

_Treatments for persistent voices_

As previously mentioned, despite the use of anti-psychotic medication up to half of individuals with psychosis continue to experience positive symptoms such as voices (Elkis, 2007). These refractory symptoms are often referred to as treatment- or medication-resistant voices; however, these terms often imply there is a lack of compliance on the behalf of the consumer or there is nothing more that can be done to facilitate recovery (Elkis, 2007). However, the notion of a meaningful recovery has significantly changed over recent years and psychological therapies for psychosis have aimed to assist individuals to better manage the distress and functional disruption often associated with refractory symptoms (Hamm, Hasson-Ohayon, Kukla, & Lysaker, 2013). Yet the delivery of psychological therapies for psychosis in public mental health settings seems to remain to be an adjunct rather than an essential part of routine care (Farhall & Thomas, 2013).

Furthermore, research suggests there is still an underlying negative view toward the efficacy for psychological interventions for chronic psychosis, and in particular for persistent voices, by clinicians in public mental health services (Hazell et al., 2017). Findings from study 3, which suggest that a focused mindfulness protocol can reduce the emotional and functional impact of persistent voices, are consistent with recent findings from Chadwick and colleague’s (2016) trial of group mindfulness for distressing voices. From a clinical perspective, these encouraging results have important implications as they provide clinicians, who perhaps at times feel despondent about the limited therapeutic options available to them when working with refractory symptoms of psychosis, with confidence in implementing such approaches. It is hoped that through the development and evaluation of further symptom-specific protocols, perspectives of
clinicians in public mental health services regarding the efficacy for such approaches will shift, and dissemination of these interventions will increase.

From a consumer perspective, the observations of improvements in the impact of voices on functioning following mindfulness, without any reliable or significant changes in positive symptoms (voices), may be especially helpful in promoting recovery. This is particularly important given chronic positive symptoms have been suggested to be related to feelings of hopelessness and a subsequent decline in active coping, in individuals with psychosis (Hoffmann, Kupper, & Kunz, 2000). Given mindfulness provides an alternate relationship with persistent voices, it is hoped, even though currently speculative, that approaches such as the iMPV program address feelings of hopelessness, inspire active coping and provide optimism to consumers to lead more rewarding and meaningful lives in the presence of psychotic symptoms.

7.5 Limitations and Future Directions

Although specific limitations of the empirical studies were discussed in each of the three papers (Chapters 4, 5, and 6), there were a few noteworthy methodological limitations across the overall thesis that warrant further discussion. For instance, the small sample sizes across all three studies resulted in reduced statistical power of the analyses. Analyses of small sample sizes increases the chance for a false null hypothesis (Type II error; Tabachnick & Fidell, 2013). Non-significant small effect sizes identified in the meta-analysis in study 1 could be a consequence of low statistical power, due to the limited number of RCTs published in the field, rather than a true non-effect. Similarly, the small sample sizes of studies 1 and 2 resulted in reduced statistical power of regression models, and the ability to conduct small pre-post comparisons only. Overall, this may have resulted in important relationships between study constructs and differences between assessment time-points not being identified as significant.

Therefore, results should be interpreted with a certain degree of caution. This limitation highlights difficulties for recruiting current voice-hearers, with a diagnosis of psychosis. To address these difficulties, it is recommended that future research conduct multi-site trials across hearing voices networks and clinics worldwide.
An additional limitation to the overall thesis relates to the design of studies 2 and 3. For instance, given the cross-sectional design utilised in study 2, the directionality and causality of identified relationships between study variables cannot be inferred by the results. The conclusions drawn within the empirical paper and the general discussion chapter should therefore be considered purely theoretical in nature and in the context of previous literature. This design was chosen for study 2, as the examination of these relationships with trait mindfulness of voices provided a theoretical underpinning and rationale for the development of a symptom-specific mindfulness protocol. Although attempts were made to include a baseline control period within the design of study 3, recruitment difficulties and a subsequent reduction in statistical power resulted in a pre-post design being employed. This resulted in comparisons on outcome measures following the iMPV intervention being limited by a lack of experimental control. It is recommended that future research conduct a larger RCT pilot of greater methodological rigor to ascertain the feasibility of such a large-scale study.

Furthermore, limitations exist regarding the measures utilised across all three empirical studies. For instance, although a focus on symptom reduction is clearly at odds with third wave therapeutic aims, the primary measure selected for inclusion in the meta-analysis in study 1 was the severity of psychotic symptoms. This decision was made due to a pragmatic need to pool data across a number of trials, in which symptom-related distress and disruption to functioning were rarely measured. Additionally, the analysis of psychotic symptoms as a primary outcome enabled comparability with previous meta-analyses of third-wave interventions and CBTp for psychosis (e.g. Cramer et al., 2016; Jauhar et al., 2014; Khoury, Lecomte, Gaudiano, et al., 2013). Given third-wave approaches are clearly premised on the idea that distress results from one’s relationship with and response to experiences and symptoms, rather than the event themselves, it is recommended that future RCTs of third-wave interventions ensure the inclusion of appropriate outcome measures that are in line with these therapeutic aims (Hayes et al., 2006; Kabat-Zinn, 1994).

Similarly, all three empirical studies of this thesis utilised individual, ordinal items of the PSYRATS, which indexed voice-related distress and disruption. These
items have demonstrated inconsistent findings in past cross-sectional research (Chadwick et al., 2007; E. Morris et al., 2014), and previous literature has proposed they may not be sensitive enough to identify clinically meaningful post-treatment effects. As mentioned in Chapter 4, even the largest CBTp study utilising the PSYRATS voice-related distress items failed to find a post-treatment effect on this measure (Birchwood et al., 2014). Therefore, it is recommended that future studies examine symptom-related distress and disruption to functioning using measures that are able to capture such impacts with greater range and degree of specificity. Given the limited availability of such measures within the field, it is recommended that future research develop and validate more appropriate outcome measures to ascertain the effectiveness of third-wave interventions.

Additionally, both studies 2 and 3 measured levels of mindful relating to difficult experiences (e.g. voices or thought and images). Generalisability of the results on these mindfulness measures was limited by the fact that information regarding participants’ previous exposure to mindfulness training was not formally obtained. Therefore, in the context of the findings from study 2, it cannot be determined whether mindful responding to voices was a reflection of a naturally occurring trait or was actually a measure of previous exposure to mindfulness exercises and strategies. Similarly, it is possible that previous exposure to mindfulness training of participants in study 3 may have impacted baseline levels of mindful responding to distressing thoughts and images. Additionally, it is unknown whether such previous experience may have influenced the acquisition and implementation of mindfulness skills following the iMPV intervention. It is suggested that future research ascertain the existence of previous exposure to mindfulness and examine the impact of such exposure on trait mindfulness and the cultivation of mindfulness strategies.

Further, when establishing the potential safety of the iMPV program in study 3, reliable or significant changes in psychotic symptoms were assessed to determine the possibility of clinical deterioration. Future research should also evaluate safety of individual mindfulness interventions with the development of a pre-defined protocol for monitoring adverse events during participation. Lastly, it should be noted that formal consumer involvement from individuals with a lived experience of hearing voices was
not attained during the conceptualisation stage of this thesis. Although more specific feedback from participants during the internal piloting of the iMPV intervention was gathered in study 3, it is recommended that future studies further involve individuals with lived experience during the conceptualisation, implementation and interpretation stages of the research. Such practices are now underway within the lab in which this study was conducted (e.g. The PERISCOPE Lived Experiences Panel).

7.6 Summary

In summary, the findings of this thesis provide a new level of insight into the usefulness of third-wave interventions for the treatment of psychosis, and the management of depressive symptoms in the context of psychosis. The findings provide new evidence to suggest improved mindfulness as a potential mechanism of change in third-wave approaches for psychosis. When considered in the context of previous literature, this body of research offers a deeper level of understanding in regard to how mindfulness may help people to adapt to the specific experience of hearing voices. Specifically, it was found that mindful relating to voices is associated with lower levels of the negative impacts often experienced by voice-hearers, affording theoretical support for the use of mindfulness with persistent voices.

The development and piloting of an individual mindfulness intervention protocol (iMPV) as part of this thesis provided a more comprehensive understanding of the subjective benefits of such an approach on the real-world impacts for individuals with persistent voices. The individual format of the iMPV intervention offers clinicians a new feasible and acceptable solution to dissemination issues for psychological interventions for psychosis. Results from the piloting of the iMPV program also provided further support for the suggestion of mindfulness as a mechanism for observed psychological change in MBIs and identified attentional switching or set-shifting as a possible neurocognitive mechanism in interventions for persistent voices warranting future investigation.

The findings of this thesis also suggest that focused symptom-specific interventions are feasible in a research context and warrant further investigation, with potential benefits of reducing heterogeneity of larger multi-component approaches and
potentially resulting in greater sensitivity to treatment-effects. In relation to clinical practice, the thesis provided further support for the appropriateness and safety for the use of mindfulness for psychosis, and specifically with persistent voices. Secondly, the results highlighted potential benefits for using technology as a way of overcoming therapeutic engagement barriers when utilising mindfulness training in psychosis. Thirdly, the findings addressed issues with dissemination of psychological therapies for psychosis by providing further support for the use of MBIs, in which delivery requires a less advanced clinical skillset. Finally, the development of the iMPV program provides an accessible protocol for working with persistent voices. Perhaps most importantly, the findings of this thesis have direct implications for those within our community that experience hearing persistent voices. This thesis provides new evidence that individuals living with persistent voices can effectively develop an alternate relationship with their voices through an approach that is humanising, normalising and acceptable. Moreover, the findings of this thesis suggest that development of a new, more mindful relationship with their voices may assist those in our community to live with less emotional and functional impairment in the presence of persistent voices.
References


Bacon, T., Farhall, J., & Fossey, E. (2014). The active therapeutic processes of acceptance and commitment therapy for persistent symptoms of psychosis:
Clients’ perspectives. *Behavioural and Cognitive Psychotherapy, 42*(04), 402-420. doi:10.1017/S1352465813000209


dominant ‘voice’in schizophrenia: A comparison of three models. Psychological Medicine, 34(8), 1571-1580. doi:10.1017/S0033291704002636


REFERENCES


REFERENCES


REFERENCES

syndromes: Findings from the 3-center AeSOP study. *Arch Gen Psychiatry, 63*(3), 250-258. doi:10.1001/archpsyc.63.3.250


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


Appendix A: Ethics Approval Certificates

ETHICS COMMITTEE CERTIFICATE OF APPROVAL

This is to certify that

Project No: 341/14

Project Title: Auditory verbal hallucinations (AVH) in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD)

Principal Researcher: Professor Susan Rossell

Project Proposal Version 4 dated: 19-Aug-2014

Participant Information and Consent Form Version 3 dated: 19-Aug-2014

was considered by the Ethics Committee on 28-Aug-2014, meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and was APPROVED on 24-Sep-2014

It is the Principal Researcher's responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Secretary of the Ethics Committee, via amendment or progress report, of:

- Any significant change to the project and the reason for that change, including an indication of ethical implications (if any);
- Serious adverse effects on participants and the action taken to address those effects;
- Any other unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role, or any other change in research personnel involved in the project;
- Any expiry of the insurance coverage provided with respect to sponsored clinical trials and proof of re-insurance;
- A delay of more than 12 months in the commencement of the project; and,
- Termination or closure of the project.

Additionally, the Principal Researcher is required to submit

- A Progress Report on the anniversary of approval and on completion of the project (forms to be provided);

The Ethics Committee may conduct an audit at any time.

All research subject to the Alfred Hospital Ethics Committee review must be conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007).

The Alfred Hospital Ethics Committee is a properly constituted Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research (2007).

SPECIAL CONDITIONS

None

SIGNED:

Professor John J. McNeil
Chair, Ethics Committee

Please quote project number and title in all correspondence
ETHICS COMMITTEE CERTIFICATE OF APPROVAL

This is to certify that

Project No: 196/10

Project Title: Establishment of the ‘Cognitive and genetic explanations of schizophrenia and bipolar disorder’ databank at the Monash-Alfred Psychiatry research centre

Principal Researcher: Professor Susan Rossell

Project Proposal version: 3 dated: 6-Aug-2010

Participant Information and Consent Form version 6 dated: 29-Sep-2010

was considered by the Ethics Committee on 22-Jul-2010 and APPROVED on 29-Sep-2010

It is the Principal Researcher’s responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Secretary of the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change, including an indication of ethical implications (if any);
- Serious adverse effects on participants and the action taken to address those effects;
- Any other unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role, or any other change in research personnel involved in the project;
- Any expiry of the insurance coverage provided with respect to sponsored clinical trials and proof of re-insurance;
- A delay of more than 12 months in the commencement of the project; and,
- Termination or closure of the project.

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The Ethics Committee may conduct an audit at any time.

All research subject to the Alfred Hospital Ethics Committee review must be conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007).

The Alfred Hospital Ethics Committee is a properly constituted Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research (2007).

SPECIAL CONDITIONS

None

SIGNED: [Signature]
Chair, Ethics Committee (or delegate)

R. FREW
SECRETARY
ETHICS COMMITTEE

Please quote Project No and Title in all correspondence.
RE: SHR Project 2014/261 - CORRECTED Ethics clearance (expedited review based on Alfred Hospital HREC ref: 341/14) [CORRECTED TITLE and PROJECT NUMBER]

Stephanie Louise <stephanie.louise@monash.edu> 20 August 2017 at 17:52

From: Astrid Nordmann

Sent: Tuesday, 21 October 2014 10:28 AM
To: Susan Rossell; Susan Rossell (SRosell@SRossell.com); Wei Lin Toh (wlin.toh@gmail.com); Neil Thomas
Cc: RES Ethics
Subject: RE: SHR Project 2014/261 - CORRECTED Ethics clearance (expedited review based on Alfred Hospital HREC ref: 341/14) [CORRECTED TITLE and PROJECT NUMBER]

To: Prof. Susan Rossell, BPsyC

Dear Susan,

SHR Project 2014/261 - Auditory verbal hallucinations in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD)

Prof. Susan Rossell, Wei Lin Toh, Neil Thomas - BPsyC

Approved Duration: 20/10/2014 to 18/08/2016 [adjusted]

I refer to the application for Swinburne ethics clearance for the above Swinburne-administered collaborative project based on the prior ethical review of the protocol and related documents by The Alfred Human Research Ethics Committee (Alfred HREC) (Alfred Project No. 341/14).

Relevant documentation pertaining to the application was as emailed on 14 October 2014 with attachments. Expedited ethical review of the proposed research was undertaken by a delegate of Swinburne’s Human Research Ethics Committee (SUHREC) significantly on the basis of the Alfred HREC review.

I am pleased to advise that, as submitted to date and concerns Swinburne, ethics clearance has been given for the project to proceed in line with standard on-going ethics clearance conditions here outlined. (Nb Alfred HREC may need to be apprised of the Swinburne ethics clearance. Should the proposed research, as regards research conducted under Swinburne auspices, require additional/other HREC review, please forward a copy of the clearances issued and approved consent instruments being used to our office for the record as soon as practicable. Should further detail or documentation be required for endorsement, we will let you know.)

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

https://mail.google.com/mail/u/1/?ui=2&ik=bcb3dadfe8&jsver=AucH8O8Khq4.en_GB.&view=pt&search=inbox&msg=15dfea08c30d04cf&dsqt=1&siml=15df... 1/2
APPENDIX A

The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project. (Reports and requests made to Alfred HREC also being submitted to Swinburne Research for processing/endorsement may suffice.)

A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about Swinburne on-going ethics clearance, citing the SUHREC project number. A copy of this clearance email should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely,
Astrid Nordmann

---------------------------------------------

Dr Astrid Nordmann

Research Ethics Officer

Swinburne Research (H68)
Swinburne University of Technology
PO Box 218, Hawthorn, VIC 3122
Tel: +613 9214 3845
Fax: +613 9214 5267
Email: anordmann@swin.edu.au

---------------------------------------------
1 October 2014

Prof Susan Rossell
Monash Alfred Psychiatry Research Centre (MAPrc)
Level 4, 607 St Kilda Road
Melbourne VIC 3004

Dear Prof Rossell,

HREC-A Protocol number: HREC-A 096/14

'Auditory verbal hallucinations (AVHs) in relation to mood in bipolar disorder (BD) and major depressive disorder.'

The St Vincent's Hospital (Melbourne) Human Research Ethics Committee-A has reviewed and approved the aforementioned study.

Approval Status: FINAL

Period of Approval: 1 October 2014 – 1 October 2018

Ethical approval is given in accordance with the research conforming to the National Health and Medical Research Council Act 1992 and the National Statement on Ethical Conduct in Human Research (2007).

Ethical and governance approval is given for this research project to be conducted at the following sites:

- St Vincent's Hospital (Melbourne)

Approved documents

The following documents have been reviewed and approved:

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<th>Document</th>
<th>Version</th>
<th>Date</th>
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<tr>
<td>National Ethics Application Form (NEAF)</td>
<td>4</td>
<td>10/09/2014</td>
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<td>Victorian Specific Module (VSM)</td>
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<td>Research Protocol</td>
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UNDER THE STEWARDSHIP OF MARY AIKENHEAD MINISTRIES

Facilities
St Vincent's Hospital Melbourne
Cardina Child Hospital
St George's Health Service
Prague House
APPENDIX A

Participant Information and Consent Form (PICF)  4  10/09/2014
Recruitment Poster  4  01/10/2014
Recruitment Flyer  3  10/09/2014

Noted documents

The following documents have been noted:

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<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDBSF Grant</td>
<td></td>
<td>20/06/2014</td>
</tr>
</tbody>
</table>

St Vincent’s HREC-A Protocol number: HREC-A 096/14
Please quote these numbers on all Correspondence

Approval is subject to:

- The Principal Researcher is to ensure that all associate researchers are aware of the terms of approval and to ensure the project is conducted as specified in the application and in accordance with the National Statement on Ethical Conduct in Human Research (2007).
- Immediate notification to the Research Governance Unit of any serious adverse events on participants.
- Immediate notification of any unforeseen events that may affect the continuing ethical acceptability of the project;
- Notification and reasons for ceasing the project prior to its expected date of completion;
- Notification of proposed amendments to the study;
- Submission of an annual report, due on the anniversary date of approval, for the duration of the study;
- Submission of reviewing HREC approval for any proposed modifications to the project;
- Submission of a final report and papers published on completion of project;
- Projects may be subject to an audit or any other form of monitoring by the Research Governance Unit at any time.

The HREC wishes you and your colleagues every success in your research.

Yours sincerely,

[Signature]

Anita Arndt
Senior Administrative Officer and HREC-A Secretary
Research Governance Unit
St Vincent’s Hospital (Melbourne)
27 October 2014

Professor Susan Rossell
C/o Wei Lin Toh
Monash Alfred Psychiatry Research Centre (MAPrc)
Level 4, 607 St Kilda Road
Melbourne, Vic 3004

Dear Prof Rossell

Re: Epworth Study No: 653-14
Title: Auditory verbal hallucinations (AVHs) in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD).

The Epworth HealthCare Board of Management approved your study at the meeting held on Wednesday 01 October 2014.

Please note that the study has been given the reference Epworth Study Number 653-14. Any correspondence relating to the project should quote this reference.

The following documents were reviewed and approved by the HREC at the meeting held on 03 September 2014:

- NEAF signed 23 July 2014
- VSM signed 06 August 2014
- Research Proposal version 3 dated 06 August 2014
- CAGEMIS PICF version 10 dated 13 March 2014
- Questionnaires:
  - Demographic information version 2 dated 29 July 2014
  - BAI version 2 dated 29 July 2014
  - BDI-II version 1 dated 25 June 2014
  - LSRS version 2 dated 29 July 2014
  - BAVQ-R version 2 dated 29 July 2014
  - BCSS version 2 dated 29 July 2014
  - CTQ version 2 dated 29 July 2014
  - MSVS version 2 dated 29 July 2014
  - NVCCQ version 2 dated 29 July 2014
  - PAM version 2 dated 29 July 2014
  - SMVQ version 2 dated 29 July 2014
  - SDQ-V version 2 dated 29 July 2014
  - MINI Screen 5.0 English version
  - WSTAR version 1 dated 25 June 2014
  - QPE-MUPS-PSYRATS-SAPS-NEVHI version 2 dated 29 July 2014
  - SCI-PANSS version 1 dated 16 July 2014
  - YRAMS version 1 dated 25 June 2014
- Advertising materials version 2 dated 30 July 2014

Thank you for submitting your amendments, the following documents are approved and meet with the recommendations of the HREC Committee:
- PICF version 7 dated 24 October 2014
- International Consortium Guidelines

Epworth HealthCare comprises:

<table>
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<th>Epworth Richmond</th>
<th>Epworth Eastern</th>
<th>Epworth Freemasons</th>
<th>Epworth Rehabilitation</th>
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<td>Victory Parade, Victoria</td>
<td>Clementon Street, Melbourne</td>
<td></td>
<td>Richmond, Brighton, Camberwell</td>
</tr>
</tbody>
</table>
To ensure compliance with NHMRC Guidelines, Guidelines for Good Clinical Research Practice (GCRP) in Australia, and in line with Epworth HealthCare’s HREC policy, it is the Principal Investigator’s responsibility and a condition of HREC approval, to ensure that:

- The HREC is notified of anything that might warrant review of the ethical approval of the project, including unforeseen events that might affect the ethical acceptability of the project.
- The HREC is notified of all Serious Adverse Events (SAEs) or Serious Unexpected Adverse Reactions (SUSARs).
- Proposed amendments to the research protocol or conduct of the research that may affect the ethical acceptability of the project are submitted to the HREC (including any relevant attachments).
- Proposed changes to the personnel involved in the study are submitted to the HREC.
- The HREC must be provided with an annual progress report for the study on the anniversary of approval.
- The HREC must also be provided with a final report upon completion of the study.
- The HREC must be notified, giving reasons if the study is discontinued at the site before the expected date of completion.

I enclose your Certificate of Approval, which notes the terms and conditions of this approval. You are requested to acknowledge these terms and conditions by signing the duplicate copy and returning it to me as soon as possible.

If any presentations or publications arise from this study, please ensure that Epworth HealthCare receives appropriate recognition and copies of presentations and publications are provided to HREC Coordinator for Committee review and file inclusion.

The Epworth HealthCare Human Research Ethics Committee is established under the National Health and Medical Research Council guidelines and adheres to the Guidelines of Good Clinical Practice, and HREC membership comprises the following:

- Chair – Reverend Professor
- Minister of Religion
- Board of Management Member
- Psychological Researcher
- Research, Data Collection and Analysis experts
- Epworth Executive member
- Lawyer
- Medical Practitioners
- Lay Persons

There is no set term of Office for Members of this Committee.

Please feel free to contact me if you have any queries or require assistance.

Kind regards,

[Signature]

Hilary Young
HREC Coordinator
Mail Box 4
88 Bridge Road
Richmond Vic 3121
Dear Prof Rossell

Re: Project 244: Auditory verbal hallucinations (AVH) in relation to mood in bipolar disorder (BD) and major depressive disorder.

I confirm that at the meeting of The Melbourne Clinic Research Ethics Committee held on the 13 August 2014 your letter (dated 23 July 2014) and the following study documents:-

- TMC Application Form
- Research Proposal (Version 2, dated 22 July 2014)
- Scales and Questionnaires:-
  - Demographic Information (Version 2, dated 29 July 2014)
  - Beck Depression Inventory (BDI-11) (Version 1 dated 25 June 2014)
  - Launay-Slade Hallucination scale (LSHA) (Version 2, dated 29 July 2014)
  - Beliefs about Voices Questionnaire – Revised (BAVQ-R) (Version 2, dated 29 July 2014)
  - Brief Core Schema Scales: Beliefs about Self and Others (BCSS) (Version 2, dated 29 July 2014)
  - Childhood Trauma Questionnaire (CTQ) (Version 2, dated 29 July 2014)
  - Making Sense of Voices (MSVS) (Version 2, dated 29 July 2014)
  - Negative voice Content Questionnaire (NVCQ) (Version 2, dated 29 July 2014)
  - Psychosis Attachment Measure (PAM) (Version 2, dated 29 July 2014)
  - Southampton Mindfulness Questionnaire for Voices (SMVQ) (Version 2, dated 29 July 2014)
  - Self-Discrepancy Questionnaire for Voices (SDQ-V) (Version 2, dated 29 July 2014)
  - MINI Screen (English Version 5.0.0, DSM-IV)
  - Wechsler Test of Adult Reading (WTAR)
  - Combined Clinical Interview (CPE-MUPS-PSYRATS-SAPS-NEVHI) (Version 2, dated 29 July 2014)
  - SCI- Structured Clinical Interview for the Positive and Negative Syndrome Scale (SCI-PANSS)
  - Young Mania Rating Scale (YMRS)
  - Patient Information and Consent Form (version 1, dated 36 June 2014)
  - Cognitive and genetic Explanations of Mental Illnesses (CAGEMS) bio-Databank Patient Information and Consent Form (version 10, dated 13 March 2014)
  - Consultant’s permission Form (version 1, dated 15 July 2014)
- Advertising Poster (undated)
- Brochure (version 1, dated 15 July 2014)
- CV – Prof Susan Rossell

Were tabled and discussed. It was decided approval will be granted after the changes listed below are provided to the committee:

The PICF – the Committee agreed that the information in Point 10a with regards to the length of data
storage; ("indefinitely") should be changed to meet the Guidelines of the NHMRC National Statement on Ethical Conduct in Human Research (2007), which requires data to be stored for 15 years.

The Committee also requested a further elaboration on the last sentence in this paragraph (10a), as it was concerned that wording “health records held at this, and other, health services”, was too vague.

**Genetic sampling** – the Committee agreed that since the project was essentially a phenomenological study that genetic sampling was not appropriate and it was not approved.

I confirm for the record that although we do not list Committee members by name that the Committee is constituted and functions in accordance with the National Statement on Ethical Conduct in Research Involving Humans (2007) issued by the National Health and Medical Research Council (NHMRC) in accordance with the NHMRC Act, 1992.

We wish you success with the research and look forward to hearing from you further.

Yours sincerely,

[Signature]

Dr Harry Derham
Chair
Research Ethics Committee
ETHICS COMMITTEE CERTIFICATE OF APPROVAL

This is to certify that

Project No: 138/14

Project Title: The Impact of a Mindfulness-Based Intervention for Auditory Hallucinations on Localised Brain Activity, Attention and Subjective Experience

Principal Researcher: Dr Neil Thomas


Participant Information and Consent Form Version 2 dated: 15-Apr-2014

was considered by the Ethics Committee on 1-May-2014, meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and was APPROVED on 6-May-2014

It is the Principal Researcher’s responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Secretary of the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change, including an indication of ethical implications (if any);
- Serious adverse effects on participants and the action taken to address those effects;
- Any other unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role, or any other change in research personnel involved in the project;
- Any expiry of the insurance coverage provided with respect to sponsored clinical trials and proof of re-insurance;
- A delay of more than 12 months in the commencement of the project; and,
- Termination or closure of the project.

Additionally, the Principal Researcher is required to submit

- A Progress Report on the anniversary of approval and on completion of the project (forms to be provided);

The Ethics Committee may conduct an audit at any time.

All research subject to the Alfred Hospital Ethics Committee review must be conducted in accordance with the National Statement on Ethical Conduct in Human Research (2007).

The Alfred Hospital Ethics Committee is a properly constituted Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research (2007).

SPECIAL CONDITIONS

None

SIGNED:

[Signature]

R Frew
Secretary, Ethics Committee

Please quote project number and title in all correspondence
To: Dr Neil Thomas, FHAD/MAPrc

Dear Neil,

**SHR Project 2015/029 The Impact of Mindfulness-Based Intervention for Auditory Hallucinations on Localised Brain Activity, Attention and Subjective Experience**

Dr Neil Thomas, FHAD/MAPrc; Ms Stephanie Louise, Prof. Susan Rossell - BPsyc
Approved Duration: 09/02/2015 to 01/05/2016

I refer to the application for Swinburne ethics clearance for the above Swinburne-administered collaborative project based on the prior ethical review of the protocol and related documents by The Alfred Human Research Ethics Committee (Alfred HREC) (Alfred Project No. 138/14).

Relevant documentation pertaining to the application was as emailed on 06 February 2015 with attachments. Expedited ethical review of the proposed research was undertaken by a delegate of Swinburne’s Human Research Ethics Committee (SUHREC) significantly on the basis of the Alfred HREC review.

I am pleased to advise that, as submitted to date and concerns Swinburne, ethics clearance has been given for the project to proceed in line with standard on-going ethics clearance conditions here outlined. (Nb Alfred HREC may need to be apprised of the Swinburne ethics clearance. Should the proposed research, as regards research conducted under Swinburne auspices, require additional/other HREC review, please forward a copy of the clearances issued and approved consent instruments being used to our office for the record as soon as practicable. Should further detail or documentation be required for endorsement, we will let you know.)

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

Astrid Nordmann
Mon 9/02/2015, 9:07 AM
Neil Thomas; RES Ethics; Susan Rossell (SRossell@SRossell.com); Stephanie Lou

Inbox

You forwarded this message on 26/02/2015 12:51 PM

To: Dr Neil Thomas, FHAD/MAPrc
Research for processing/endorsement may suffice.)

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about Swinburne on-going ethics clearance, citing the SUHREC project number. A copy of this clearance email should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely,

Astrid Nordmann
for Keith Wilkins, Secretary SUHREC

---------------------------------------------------------------
Dr Astrid Nordmann
Research Ethics Officer
Swinburne Research (H68)
Swinburne University of Technology
PO Box 218, Hawthorn, VIC 3122
Tel: +613 9214 3845
Fax: +613 9214 5267
Email: anordmann@swin.edu.au
---------------------------------------------------------------
Auditory verbal hallucinations (AVHs) in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD)

Principal researcher: Prof Susan Rossell

Participant Information and Consent Form (PICF)

1. Introduction
You are invited to take part in this research project conducted by researchers at the Monash Alfred Psychiatry Research Centre (MAPrc) and Brain and Psychological Sciences Research Centre (BPsyC). This Participant Information and Consent Form (PICF) tells you about the research project. It explains the procedures involved. Knowing what is involved will help you to decide if you wish to take part in the project. Please read this information carefully. Ask questions about anything you don’t understand or want to know more about. Before deciding whether to take part, you might want to talk about it with a relative, friend or healthcare worker.

Participation in this research is voluntary. If you don’t wish to take part, you don’t have to. You will receive the best possible care whether you take part or not. If you decide you want to take part in the project, you will be asked to sign the consent section. By signing it, you are telling us that you:

- understand what you have read;
- consent to take part in the research project;
- consent to participate in the research processes described;
- consent to the use of your personal and health information as stated.

You will be given a copy of this PICF to keep.

2. What is the purpose of this research project?
The purpose of this research project is to examine the characteristics of ‘voice hearing’ experiences in patient and healthy participant groups. Other than in schizophrenia and schizoaffective disorder, patients with bipolar disorder or major depressive disorder, and also healthy adults in the general population, are known to ‘hear voices’ and/or other sounds that are not actually present. Such events are referred to as auditory verbal hallucinations (AVHs). In this study, we aim to compare and contrast the experiences of AVHs in these populations, as well as explore underlying belief systems surrounding these experiences.

3. What does participation in this research project involve?
Participants invited to take part will be aged between 18 and 65, experience past or current AVHs, and belong to one of the four following groups:
You will be asked to take part in a single interview session. In the first part of the session, you will be asked to complete a standard questionnaire asking questions about your demographic information, for example, age and education. This will be followed by a brief clinical interview asking questions about your mental health history to confirm that patients have the appropriate diagnosis, and healthy participants do not have a history of mental illness. If a mental illness is uncovered via this interview process, the individual involved will be provided with appropriate support and referral to clinical services. Patients will also be asked to provide information regarding current symptoms they are experiencing, including their responses to, and the emotional impact of, these symptoms. In the second part of the session, you will be asked to undergo a longer clinical interview asking questions about your experiences of ‘hearing voices’. For instance, questions would include the frequency, duration, loudness, and other characteristics of the voice(s). In addition, questions will be asked about your belief systems surrounding these experiences. For instance, where do you think these voices come from, and what purpose do they serve?

Total assessment time will be up to 3 hours. To minimise fatigue, regular breaks and refreshments will be provided. At the end of the session, you will be reimbursed $50 to cover your time and transport costs. Interviews will take place at MAPrc, Level 4, 607 St. Kilda Road, or the hospital/clinic where you were recruited (if preferred).

This research project involves the collection of information about your use of illegal drugs. That information will be stored in a re-identifiable (or coded) format. In the event that we are required to disclose that information, it may be used against you in legal proceedings.

4. Data contribution to a bio-databank

We ask you to permit us to store the data collected for this project in the research bio-databank Cognitive and Genetic Explanations of Mental Illnesses (CAGEMIS). This will be administered by Prof Susan Rossell at MAPrc. This bio-databank aims to collect cognitive and genetic information on patients with schizophrenia, schizoaffective disorder, bipolar disorder and major depressive disorder from this and future related projects. You will be asked to indicate your willingness to contribute at the end of this form. If you consent to contribute your data, you will be asked to complete a separate PICF. Agreeing to contribute your data to the bio-databank does not require you to undergo any additional tests or measures. This is optional, and your decision to take part or not, in this additional component will not affect your participation in the current study. The purpose of the bio-databank is to provide information that can be used for future ethically approved research into these disorders.

5. What are the possible benefits?

There are no personal benefits from taking part in this research, but many people do report that they enjoy the experience of participating in, and thereby contributing to scientific research. In addition, the results of this study could prove beneficial in terms of advancing our knowledge of AVHs. At the same time, this might spur the development of new treatments targeted at AVHs in bipolar disorder and major depressive disorder.

6. What are the possible risks?

The clinical interview will involve the discussion of personal experiences of ‘hearing voices’ and related belief systems surrounding these experiences. As such, there is a possibility you may find these topics distressing. The likelihood of distress is low however, as the questions asked are
designed for research purposes, and researchers are trained to ask clinical questions in a careful and considerate manner to avoid causing psychological distress. In the unlikely event that you do feel distressed, please immediately let the researcher know. The Principal Investigator will be available to speak with you about any aspect of the study, or refer you to a professional who can manage your specific concerns.

7. Do I have to take part in this research project?
Participation in any research is voluntary. If you don’t wish to take part, you don’t have to do so. If you decide to take part and later change your mind, you are free to withdraw at any time. If you decide to withdraw, please notify a member of the research team.

If you decide to leave the project, the researchers would like to keep the personal and health information about you that has been collected. This is to allow them to conduct some preliminary analyses on the data that has already been gathered from you. If you don’t want them to do this, please tell them when you withdraw. Your decision to take part or not, or to take part and then withdraw, will not affect your relationship with the researchers or members of your treating team.

8. Could this research project be stopped unexpectedly?
There are no known reasons for this project to be stopped unexpectedly before it is completed. However, in the unlikely event that the project is unexpectedly stopped, you will be reimbursed for any time you have already spent participating in the study.

9. How will I be informed of the results of this research project?
At the end of the study, a report of the study findings will be made available to you by post or email, if you have elected to receive such communication. These results will also be reported in a thesis, published in appropriate scientific journals and presented at academic conferences. Please note that information will be provided in such a way that you cannot be identified, except with your permission. All participants will remain anonymous, with results presented as group data only.

10. What else do I need to know?
   a. What will happen to information about me?
   Any information obtained for the purposes of this research project that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or in compliance with the law. Paper-and-pencil questionnaires will be stored indefinitely in a locked cabinet and electronic data will be stored indefinitely in password-protected computers. These are located at MAPrc, and can only be accessed by the Principal Investigator.

   Ms Monique Scott and Ms Zalie Merrett will be using the results of this research project to obtain their Doctor of Psychology (Clinical) degree. Ms Michelle Robertson and Ms Inge Gnatt will be using the results of this research project to obtain their Bachelor of Psychology (Honours) degrees. However, in any research report, publication and/or presentation, information will be provided in such a way that you cannot be identified.

   If you agree, and sign the additional CAGEMIS consent form, data from this current study will also be shared with the CAGEMIS bio-databank. Information will be coded in this bio-databank, and stored in re-identifiable form, as outlined in the CAGEMIS information sheet.

   b. How can I access my information?
   In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to access the information collected and stored by the researchers about you. You
c. What happens if I am injured as a result of participating in this research project?

If you suffer an injury as a result of participating in this research project, hospital care and treatment will be provided by the public health service at no extra cost to you, if you elect to be treated as a public patient (applies only to individuals eligible for Medicare).

11. Ethics approval

The ethical aspects of this research project have been approved by the Human Research Ethics Committee at the Alfred Hospital. This study will be carried out according to the National Statement on Ethical Conduct in Human Research (2007) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies.

12. Who can I contact?

Who you may need to contact will depend on the nature of your query, so please note the following.

For further information:
If you want any further information concerning this project, or if you have any medical problems which may be related to your involvement in the project, such as side effects, you may contact:

Prof Susan Rossell, Principal Investigator, (03) 9076 8650

For complaints:
If you have any complaints about any aspect of this research project, the way it is being conducted, or any questions about being a research participant in general, you may contact:

Complaints Officer, Office of Ethics & Research Governance, Alfred Health, (03) 9076 3619, research@alfred.org.au

Please quote the following Alfred Health project number: 341/14.
Auditory verbal hallucinations (AVHs) in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD)

Principal researcher: Prof Susan Rossell

13. Consent

I, ………………………………………………………………………………………… (name of participant) agree to participate in the research project titled ‘Auditory verbal hallucinations (AVHs) in relation to mood in bipolar disorder (BD) and major depressive disorder (MDD)’.

My agreement is based on the understanding that:

• I have read this document and understand the purposes, procedures and risks of the research project as described within it;
• I have had an opportunity to ask questions and I am satisfied with the answers I have received;
• I freely agree to participate in this project, according to the conditions on the PICF;
• I agree to participate in this project, understanding that my identity will remain confidential, and that I may withdraw at any time;
• The researcher has agreed not to reveal my identity and personal details, if information about the project is published or presented in any public form;
• I understand that I will be given a copy of this document to keep.

I agree/ do not agree to be given the PICF for Cognitive and Genetic Explanations of Mental Illnesses (CAGEMIS) bio-databank for consideration.

I agree/do not agree to receive the report of study findings upon project completion via

☐ Email …………………………………………………………………………………….. or

☐ Post ………………………………………………………………………………………

Participant’s name (printed): ……………………………………………………………

Signature: ………………………………………………………………………………… Date: …………………………………

Declaration by researcher: I have given a verbal explanation of the research project, its procedures and risks, and I believe that the participant has understood that explanation.

Researcher’s name (printed): ……………………………………………………………

Signature: ………………………………………………………………………………… Date: …………………………………
PARTICIPANT INFORMATION AND CONSENT FORM


Full project title: The Impact of a Mindfulness-Based Intervention for Auditory Hallucinations on Attention and Subjective Experience

Principal Researcher: Dr Neil Thomas

Associate Researchers: Professor Susan Rossell, Dr Matthew Hughes, Dr William Woods, Dr Erica Neil, Mr Eric Tan, Miss Stephanie Louise, Miss Sarah Lancaster.

1. Introduction
You are invited to take part in this research project. The research project is aiming to evaluate the outcomes of an intervention for people who hear voices (or experience auditory hallucinations).

This Participant Information and Consent Form tells you about the research project. It explains the procedures involved. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you don’t understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with a relative, friend or healthcare worker.

Participation in this research is voluntary. If you don’t wish to take part, you don’t have to. Participation in this project is in addition to the usual care you receive from mental health services, and will not make any difference to the other care you receive.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:
• understand what you have read;
• consent to take part in the research project;
• consent to participate in the research processes that are described;
• consent to the use of your personal and health information as described

You will be given a copy of this Participant Information and Consent Form to keep.

2. What is the purpose of this research project?
The purpose of this project is to examine the effects of a four-week course in mindfulness on changes in the experience of voices and attention.

Mindfulness is a particular skill in deliberately focusing attention and becoming less caught up in thought or distracting sounds in the environment. It can be learnt through meditation-like exercises, which involve practising sustained attention for periods of a few minutes or more at a time.

We know from previous research that mindfulness-based interventions have been found to be effective for the treatment for a range of physical and mental health problems. More recently, there has been encouraging findings for the use of mindfulness-based interventions for people...
who hear voices. These studies suggest that mindfulness might be useful in reducing the intensity of voices and/or how much impact they have.

We hope this study will help us better understand what processes are involved in hearing voices, how mindfulness works, and how treatments can be developed that help people respond to voices more effectively.

A total of 16 people will participate in this project.

This research has been initiated by the investigators named above. It is supported by a grant from the National Health and Medical Research Council and by Swinburne University’s Faculty of Health, Arts and Design.

3. **What does participation in this research project involve?**

There are two main parts of this project

1. **Assessments.** Completion of a series of assessments including interviews and computer-based tasks that will be conducted over four sessions (approximately 1.5-2.5 hours per session) and held at the Monash Alfred Psychiatry Research Centre (MAPrc) and the Brain and Psychological Sciences Research Centre, Swinburne University. These assessments will help us to understand how things change over time in relation to learning skills in mindfulness. A list of visits can be seen below.

   - **Week 1, Session 1:** Demographics and clinical interview (including computer-based and paper and pencil attention tasks) – 2 - 2.5 hours
   - **Week 5, Session 2:** Clinical interview (including computer-based and paper and pencil attention tasks) – 1.5-2 hours
   - **Week 10, Session 3:** Clinical interview (including computer-based and paper and pencil attention tasks) – 1.5-2 hours
   - **Week 18, Session 4:** Clinical interview (including computer-based and paper and pencil attention tasks) – 1.5-2 hours

2. **Mindfulness Course.** Taking part in a four-week mindfulness course that will be held at the Voices Clinic, Monash Alfred Psychiatry Research Centre.

**Assessments**

We will ask you to meet up with a member of our research team to complete some interviews and computer-based tasks within the next couple of weeks, then again in five weeks time, then again five weeks after that and then again 8 weeks after that. Each appointment will last approximately 1.5-2.5 hours.

All participants will be asked to fill in a standard questionnaire that asks questions about their demographic information for example, age and education. In addition, they will be asked to complete a short interview, which asks questions about their mental health. Additionally, all participants will be required to complete some computer-based or paper-and-pencil measures that are designed to assess thinking abilities, such as attention and inhibition.

**Study Day restrictions.** On each of the four testing days we ask that you follow these restrictions:

   - No caffeine-containing products on the testing day
   - No alcohol in the 24 hours before the testing session.

This is because caffeine and alcohol have been shown to affect cognitive performance. Should you breach these restrictions, please contact us prior to coming to the research centre so we can rearrange your testing session.
Mindfulness Course
The mindfulness course will involve meeting with a clinician once a week for four weeks. Meetings will last for one hour. Each meeting will involve one-on-one practice in guided exercises designed to improve your attention alongside discussions about mindful responding as an alternative to usual reactions to voices and non-judgemental awareness of voices. The sessions will be held at the Voices Clinic at the Monash Alfred Psychiatry Research Centre, weekly, with the first session lasting up to two hours and the following sessions usually lasting up to an hour.

We will be asking people who take part in this to practice mindfulness at home as well. We will provide you with an audio CD on which you will have some guided exercises. These require practising once per day for about 15-20 minutes. Participation will also involve documenting this home practice in a diary.

The clinician you will meet with will be a provisional psychologist who is undertaking a PhD in Clinical Psychology. The work they will do with you will be supervised by a clinical psychologist who has extensive experience in helping people deal with hearing voices.

Optional data contribution to a bio-databank
In addition, we will ask you to permit us to store test data collected for this project in the research bio-databank: Cognitive and genetic explanations of mental illnesses bio-databank (CAGEMIS). This will be administered by Prof Susan Rossell at the Monash Alfred Psychiatry Research Centre. This bio-databank is aiming to collect cognitive and genetic information on patients with schizophrenia from this and future related projects. You will be asked to indicate your willingness to contribute at the end of this consent form.

If you consent to contribute your test data, you will need to complete a separate participant information sheet and consent form. Agreeing to contribute your test data to the bio-databank does not require you to undergo any additional tests or measures. This is optional, and your decision to take part or not to take part in this additional component will not affect your participation in this current study. The purpose of this bio-databank is to provide information that can be used for future, ethically approved, research into schizophrenia.

4. What are the possible benefits?
We cannot guarantee or promise that you will receive any benefits from this research. However, we hope that this project may be able to benefit you through learning a skill, which may help you to cope more effectively with hearing voices.

We also hope this study will benefit others in the future who experience voices by helping us to understand whether what we are doing in this project is a useful approach and how best to use it.

5. What are the possible risks?
Interviews and mindfulness course. Discussing voices and other experiences as part of the interviews and mindfulness course may involve discussing things, which are emotional or distressing. Additionally, sometimes people report that mindfulness can lead to increased awareness of unpleasant thoughts or memories. Where experiences have been of a traumatic or difficult nature, there is a possibility that recalling these events may cause you to feel upset or distressed. If you do feel distressed when being interviewed or during the intervention, please let the interviewer or clinician know. If you feel uncomfortable talking about these things then at any time you are free to say you don’t want to talk about them, to have a break, or to discontinue your participation.

At the beginning, we will ask you to nominate a designated contact person who is not involved in this project. This could be a nurse, doctor, case manager or other support worker who you have current contact with. This is so that if you wanted any further support after any of the
appointments, you know you can speak to that person. If we had any concerns about you, we
would also encourage you to speak to that support person and we could help you to do that. Of
course you can also speak to one of the research team.

6. What if new information arises during this research project?
During the research project, new information about the risks and benefits of the project may
become known to the researchers. If this occurs, you will be told about this new information and
the researcher will discuss whether this new information affects you.

7. Can I have other treatments during this research project?
You can continue to receive the usual treatment and support from your mental health services
during the course of your involvement in this project without restriction.

8. Are there alternatives to participation?
Participation in this research is not your only option in dealing with hearing voices. Other options
include seeing a therapist to talk about your voices, attending a peer-support group, or asking for
a review of your medication. You can take time to discuss these options with your doctor or
healthcare worker before deciding upon participation in this project.

9. Do I have to take part in this research project?
Participation in any research project is voluntary. If you do not wish to take part you are not
obliged to. If you decide to take part and later change your mind, you are free to withdraw from
the project at any stage.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not
affect your routine treatment, your relationship with those treating you, or your relationship with
The Voices Clinic, Monash Alfred Psychiatry Research Centre, or Swinburne University.

10. What if I withdraw from this research project?
If you decide to leave the project, the researchers would like to keep the information about you
that has been collected. This is to help them make sure that the results of the research can be
measured properly. If you do not want them to do this, you must tell them before you join the
research project.

11. How will I be informed of the results of this research project?
On completion of the project we will provide a plain language report of the project results that we
can send you a copy of by post or email if you request this.

12. What else do I need to know?

• What will happen to information about me?
It is desirable that your designated contact person be advised of your decision to participate in
this research project. By signing the consent section, you agree to them being notified of your
participation in the project and broad details of your involvement such as what the project
involves, when you have been or will be seen by researchers, and when your involvement has or
will discontinue. We would also inform your designated contact person if we were concerns
about your safety or that of others.
With this exception, any information that can identify you obtained for the purpose of this research project will be treated as confidential and securely stored. It will be disclosed only with your permission, or in compliance with the law.

This study involves the collection of information about your use of illegal drugs, e.g. marijuana. We will generally not disclose that information without your consent but there may be circumstances where we have to do so for legal reasons. In that case, the information could potentially be used against you in legal proceedings or otherwise (i.e. information about drug use may be considered relevant in a criminal investigation). To our knowledge, researchers at this institution have not been required by law to provide information. If we were ever required to do so, we would do our best to notify you before disclosing it.

In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your permission. Miss Stephanie Louise will be using the results of this research project to obtain her Doctor of Philosophy (Clinical Psychology) degree. However, in any research report, publication and/or presentation, information will be provided in such a way that you cannot be identified.

The information that we collect from you as part of this research project will be stored securely at the Monash Alfred Psychiatry Research Centre.

Additionally, if you give your permission, information you provide us may also be used for other projects related to this research project, which we have not planned at this stage.

• How can I access my information?
In accordance with relevant Australian and/or Victorian privacy and other relevant laws, you have the right to access the information collected and stored by the researchers about you. You also have the right to request that any information, with which you disagree, be corrected. Please contact one of the researchers named at the end of this document if you would like to access your information.

• What happens if I am injured as a result of participating in this research project?
If you suffer an injury as a result of your participation in this research project, please contact the research staff. Hospital care and treatment will be provided by the public health care system (Medicare) at no cost to you if you are eligible for Medicare benefits and elect to be treated as a public patient.

• Is this research project approved?
The ethical aspects of this research project have been approved by the Human Research Ethics Committee of Alfred Health.

This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies.

• Will I receive any reimbursement?
Yes, you will be reimbursed $30, at the end of each of the four assessment sessions (clinical assessments), for your time and travel costs to attend these sessions.

• Future contact
Our study into ways of helping people with the experience of hearing voices is ongoing. We may do a follow-up study to look at how people’s experiences change over time or do other studies on the experience of hearing voices. Therefore we would like to obtain your permission to contact you in the future about other studies. If you provide your permission for us to contact you again,
the Principal Investigator will retain your contact details and store them securely, separately from any data you provide. If we were to contact you, we would call you and ask if you wanted to participate in another study. You would be under no obligation to participate in any other study. You can also change your mind about being contacted again and we will delete your contact details on request. You will be asked to indicate your willingness for this at the end of this consent form.
13. Consent

I, ………………………………………………………………………… (Name of participant) agree to participate in a research project entitled: The Impact of a Mindfulness-Based Intervention for Auditory Hallucinations on Attention and Subjective Experience

Conducted by: Dr Neil Thomas, Professor Susan Rossell, Dr Matthew Hughes, Dr Will Woods, Dr Erica Neill, Mr Eric Tan, Ms Stephanie Louise, Ms Sarah Lancaster.

My agreement is based on the understanding that:

- I agree to participate in this activity, realizing that my identity will remain confidential, and that I may withdraw at any time.
- I freely agree to participate in this project according to the conditions on the Participant Information.
- I will be given a copy of the Participant Information and Consent Form to keep.
- My consent to participate in this project is given freely.
- The researcher has agreed not to reveal my identity and personal details if information about the project is published or presented in any public form.
- I understand the time involved in each of the recording and testing sessions.

I have read this document and I understand the purposes, procedures and risks of this research project as described within it.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project, as described.

☐ I agree to be given the information sheet and consent form for ‘Cognitive and genetic explanations of mental illnesses’ bio-databank for consideration.

☐ I have participated in the related study (Project 430/11) An MEG study of auditory verbal hallucinations and inhibition in patients with schizophrenia. If you answer yes to this, we will ask you to complete a separate form to indicate whether you agree to have your results from this previous project released to the current researchers. This will allow us to use data from this study instead of repeating the assessments again.

I understand that I will be given a signed copy of this document to keep.

Participant’s name (printed) …………………………………………………

Signature    Date

Name of witness to participant’s signature (printed) ………………………………………

Signature    Date

Declaration by researcher: I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Researcher’s name (printed) …………………………………………………

Signature    Date

Note: All parties signing the consent section must date their own signature.
EXTENDED USE OF INFORMATION FOR OTHER PROJECTS
I am aware that the information I provide as part of the project described above may also be used at a future time for other related research projects. I understand that any additional use of the information I have provided will be treated as confidential as outlined above.

☐ I agree for information to be used for other related projects.
☐ I do not wish for my information to be used for other related projects.

SIGNED:........................................................................................ DATE:...............................  

FUTURE CONTACT REGARDING OTHER PROJECTS
I understand that if I give my permission, the researchers may contact me to invite me to participate in future studies. I am aware that by agreeing to be contacted some time in the future I am not obliged to participate.

☐ I agree to be contacted by the researchers of the above project about future projects.
☐ I do not wish to be contacted regarding future projects.

SIGNED:........................................................................................ DATE:...............................
14. Who can I contact?

Who you may need to contact will depend on the nature of your query, therefore, please note the following:

For further information or appointments
If you want any further information concerning this project you can contact:

Name: Dr Neil Thomas
Role: Principal Researcher
Telephone: (03) 9214 8742

Name: Professor Susan Rossell
Role: Associate Researcher
Telephone: (03) 9214 8173

Monash Alfred Psychiatry Research Centre
PO Box 315, Prahran 3181, Victoria, Australia
Level 4, 607 St Kilda Road, Melbourne 3004, Australia
Tel: 03 9076 6564

Brain and Psychological Sciences Research Centre,
Faculty of Health, Arts and Design,
Swinburne University of Technology
Mail H99
PO Box 218
Hawthorn VIC 3122
Australia

For complaints:
If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

Name: Ms Emily Bingle
Position: Research Governance Officer
Department: Office of Ethics & Research Governance
Institution: Alfred Health
Telephone: 03 9076 3619

You will need to tell Ms Bingle the following Alfred Health project number: 138/14.
DEMOGRAPHICS

1. Date of Birth: ______ - ______ - ______
   Day        Month       Year

2. Age on day of testing: ______ years

3. Sex:
   □ Male
   □ Female

4. Country of Birth:
   □ Australia
   □ UK and Ireland
   □ Europe (including former USSR)
   □ North America
   □ Central and South America
   □ NZ, Pacific islands, PNG
   □ East Asia (China, Japan, Korea, Taiwan, Hong Kong)
   □ South East Asia
   □ Indian subcontinent and other Asia
   □ Middle East
   □ North Africa
   □ Central and Southern Africa
   □ Other_____________________

5. Ethnicity:
   □ Caucasian
   □ African descent
   □ Asian
   □ Hispanic
   □ Aboriginal or Torres Strait Islanders
   □ Other_____________________

Are both of your mothers parents white Caucasian?
_________________________________________________________________________
_________________________________________________________________________

Where are each of your mother’s parents from?
_________________________________________________________________________
_________________________________________________________________________

Mindfulness, Auditory Hallucinations, Attention & Subjective Experience
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Are both of your fathers parents white Caucasian?
________________________________________________________________________________
______________________________________________________________________________
Where are each of your father’s parents from?
________________________________________________________________________________
______________________________________________________________________________
6. Primary Language
☐ English
☐ Other __________________________

7. Marital Status:
☐ Single (Never married)
☐ Defacto
☐ Married
☐ Divorced
☐ Separated
☐ Widowed
☐ Other __________________________

8. Living Arrangements:
☐ Private house/flat
☐ Living with parents / relatives
☐ Boarding room/house
☐ Supported Residential Services
☐ Institution/Hospital
☐ Homeless
☐ Other __________________________

9. Education (tick highest level completed):
☐ Primary School qualification
☐ Secondary School qualification
☐ Trade Certificate/apprenticeship
☐ Tafe/Diploma
☐ Undergraduate university degree
☐ Post graduate Degree
☐ Masters/Doctorate/PhD
☐ Other __________________________

Total years of Education (including primary school, high school and any completed or further education: ____________
10. Employment (tick the most appropriate box):

- [ ] Unemployed (seeking work)
- [ ] Unemployed (not seeking work)
- [ ] Employed Full-time
- [ ] Employed Part-time
- [ ] Employed Casual
- [ ] Self-employed
- [ ] House duties
- [ ] Student – Full time
- [ ] Student – part time
- [ ] Student – part time plus paid work
- [ ] Retired
- [ ] Volunteer work

What is your main area of employment?
________________________________________________________________________________
________________________________________________________________________________

What is/was your mother’s main employment?
________________________________________________________________________________
________________________________________________________________________________

What is/was your father’s main employment?
________________________________________________________________________________
________________________________________________________________________________

11. Smoking

Number of cigarettes a day:
- [ ] Nil
- [ ] 1-10 per day
- [ ] 11-20 per day
- [ ] 20+
12. Alcohol Consumption

How often do you drink alcohol and how much do you consume?

- Don’t drink
- Drink occasionally (less than once a week)
- Drink only at weekends – moderate use
- Drink only at weekends – drink uncontrolled
- Drink every day in moderate amounts
- Drink every day moderately - some days in excess (to intoxication)
- Drink to intoxication (excess) every day

When was your last drink? How much did you drink?

13. Please list all medication that you are currently taking (including blood thinners; contraceptive medications; regular herbal medications)

<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Medication purpose</th>
<th>Dosage</th>
<th>Times per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. Medication XX</td>
<td>Mood stabiliser</td>
<td>10mg</td>
<td>Twice</td>
</tr>
</tbody>
</table>

14. Pain Relief medication during last 6 months

- Codeine more than once per week
- Other pain relief more than once per week

Please provide details: __________________________________________
NEUROLOGICAL DISORDERS
Have you ever been told that you have been diagnosed with any of the following conditions?

- Dementia
- Alcoholism
- Parkinson’s disease
- Epilepsy (Seizures)
- Hypertension
- Stroke
- Other
- Multiple Sclerosis
- Substance Abuse
- Huntington’s disease
- Autism
- Acquired Brain Damage
- Migraines
- Other

Do you have any medical conditions not mentioned above?
________________________________________________________________________________
________________________________________________________________________________

FAMILY HISTORY
Has anyone in your family been diagnosed with a psychiatric illness? If yes, please detail:
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

DRUG OVERDOSE
Have you ever had a drug overdose?
- No
- Yes
- Unsure

If you HAVE had an overdose, did you lose consciousness following that overdose?
- No
- Yes
- Unsure

If you HAVE had an overdose, did you have to go to hospital?
- No
- Yes
- Unsure

If you HAVE had an overdose, Were you unconscious for longer than 5 minutes?
- No
- Yes
- Unsure
HEAD INJURY
Have you ever suffered a head injury?
☐ No ☐ Unsure ☐ Yes

If you HAVE had a head injury, did you lose consciousness?
☐ No ☐ Unsure ☐ Yes

If you HAVE had a head injury, did you have to go to hospital?
☐ No ☐ Unsure ☐ Yes

If you HAVE had a head injury, were you unconscious for longer than 5 minutes?
☐ No ☐ Unsure ☐ Yes

CHILDHOOD EXPERIENCES (between infancy and 16 years)

What was your father’s age when you were born? __________________

Did you grow up in a rural or urban (city) environment? (can tick more than one box)
☐ Urban Town/ City / Area or Postcode: ____________

☐ Rural – before age 5 Town/ City / Area or Postcode: ____________

☐ Rural – after age 5, until 16 years Town/ City / Area or Postcode: ____________

Are you a twin or of multiple births?
☐ No ☐ Yes twin ☐ Yes – three plus children
Was your development as a young child (under 5) different to other children of the same age.
For example, did you walk and talk at the same age as other kids?
☐ Yes
☐ No
If no, please specify:
________________________________________________________________________________
________________________________________________________________________________

Did you have any learning difficulties as a child? (for example, did you have difficulty learning to read, did you have particular difficulty with mathematics) or any other learning difficulties you can recall
________________________________________________________________________________

How would you describe yourself as a child?
☐ No problems
☐ Shy and quiet
☐ Loud and hyperactive
☐ Other behavioural problems
If you selected ‘Other’ please explain:
________________________________________________________________________________

Did you suffer the loss of a close relative or friend as a child?
☐ No
☐ Yes
If ‘Yes’ please specify:
________________________________________________________________________________
Did you suffer any of the following traumatic events in your childhood?

1. Serious accident, fire or explosion  
   - Yes  
   - No
2. Natural disaster (tornado, flood, hurricane, major earthquake)  
   - Yes  
   - No
3. Non-sexual assault by someone you know (physically attacked/injured)  
   - Yes  
   - No
4. Non-sexual assault by a stranger  
   - Yes  
   - No
5. Sexual assault by a family member or someone you know  
   - Yes  
   - No
6. Sexual assault by a stranger  
   - Yes  
   - No
7. Military combat or a war zone  
   - Yes  
   - No
8. Sexual contact before you were age 18 with someone who was 5 or more years older than you  
   - Yes  
   - No
9. Imprisonment  
   - Yes  
   - No
10. Torture  
    - Yes  
    - No
11. Life-threatening illness  
    - Yes  
    - No
12. Other traumatic event  
    - Yes  
    - No
13. If “other traumatic event” is checked YES above; please write what the event was  
    ____________________________________________________________________

14. Of the questions to which you answered YES, which was the worst ____________________  
    (Please list the question #)
Appendix D: Empirical Study One Manuscript

Mindfulness- and acceptance-based interventions for psychosis: Our current understanding and a meta-analysis

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In promoting optimal recovery in persons with psychosis, psychological interventions have become a key element of treatment, with cognitive behavioural therapy being widely recommended in clinical practice guidelines. The key area of development has been the trialling of “third wave” cognitive behavioural interventions, which promote mindfulness, acceptance and compassion as means of change. Trials to date have demonstrated encouraging findings, with beneficial effects observed on measures of psychotic symptoms. This meta-analysis evaluated the efficacy of third wave interventions for the treatment of psychosis in randomised controlled trials, with psychotic symptoms as the primary outcome. Overall, 10 studies were included. The primary outcome demonstrated a small but significant effect (g = 0.29) for third wave interventions compared with control post-treatment. Trials of group format mindfulness-based interventions showed larger effects (g = 0.46) than individual acceptance and commitment therapy based interventions (g = 0.08), although methodological differences between trials were noted. Among secondary outcomes, a moderate, significant treatment effect (g = 0.39) was found for depressive symptoms, but no significant effects were found on specific measures of positive and negative symptoms, hallucination distress, or functioning/disability. A moderate effect on mindfulness (g = 0.56) was observed, but not on acceptance. Overall, findings indicate that third wave interventions show beneficial effects on symptoms in persons with psychotic disorders. However, further research is required to determine the efficacy of specific models of treatment.

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mindfulness practices or experiential exercises that focus on maintain- 
ing a ‘detached awareness’ in the presence of internal psychotic expe- 
rience (Chadwick et al., 2009). It has been suggested this process 
provides an alternate relationship with psychotic experience and de-
creases the likelihood of becoming consumed by unhelpful, habitual re-
actions (Abba et al., 2008; Chadwick et al., 2009). Furthermore, by 
oberving psychotic symptoms, such as voices or delusional thoughts, 
with an open, non-judgemental and curious awareness and without un-
helpfully reacting, patients are better able to reclaim power over such 
experiences (Abba et al., 2008). Additionally, it has been suggested 
that acknowledgment and non-judgemental acceptance of psychotic 
symptoms facilitates an increased awareness of associated negative 
judgments about the self (Goodhille et al., 2010) which third wave in-
terventions might help to address by reducing attachment to negative 
self-beliefs. Furthermore, compassion-based approach may facilitate 
greater self-compassion as a means to reduce the impact of negative 
judgments about the self. Moreover, a focus in third wave approaches 
on the whole person rather than on symptoms is considered to be vital 
in re-establishing one’s identity beyond psychosis (Goodhille et al., 2010).

In a meta-analysis of third-wave or mindfulness- and acceptance-
based interventions for psychosis, Khoury et al. (2013b) reported a 
small-to-moderate treatment effect on positive symptoms from pre-
to post-therapy (Hedge’s g = 0.32). Likewise, a recent meta-analysis 
of Cranner et al. (2016) identified moderate between-group treatment 
effects of mindfulness- and acceptance-based therapies on positive 
symptoms (SMD = 0.57). However, the number of studies available 
for both these previous meta-analyses was limited for examining be-
tween-group effects (8). Furthermore, analysis for between group dif-
ferences on positive symptoms by Cranner et al. (2016) included only 
one mindfulness-based study. Since these recent meta-analyses a num-er of further trials have been published, including two large RCTs (Chadwick et al., 2016; Shawyer et al., 2016). Given these new trials, 
we conducted a comprehensive and up-to-date meta-analysis of RCTs, 
with an aim of determining the efficacy of these third-wave interven-
tions for psychosis.

2. Method

2.1. Eligibility criteria

Studies were selected meeting the following criteria: 1) randomised 
controlled trials, 2) the experimental treatment was a mindfulness-, ac-
ceptance- or compassion-based intervention for psychosis, 3) partici-
pants were adults diagnosed with a psychotic disorder, with >50% 
having a schizophrenia/schizoaffective disorder diagnosis, and 4) in-
cluded quantitative measures of the primary or secondary outcomes. 
Both individual- and group-format interventions were considered. We 
excluded studies that: 1) relied on self-reported symptomatology rather 
than diagnosis, 2) targeted participants with comorbid intellectual dis-
ability or substance dependence, 3) reanalysed data previously reported 
in another included study, or 4) were not published in peer-reviewed 
journals.

2.2. Information sources

Literature searches were conducted using PsychINFO, MedLine and 
EMBASE, from the first available date until September 14th 2016. Addi-
tionally, reference lists of prior reviews and retrieved articles were man-
ually searched. The following terms were combined in keyword searches: 
mindful-
ness, meditation, acceptance, person-based cognitive therapy, compas-
sion-focused, or compassionate mind; and schizophrenia, psychiatric, 
psychosis, paranoia*, delusion*, hallucination*, distressing voices, voice 
hearing, or hearing voice*.

2.3. Data collection process and data items

Data were initially extracted by SL and checked by MF. The current 
analysis was limited to end-of-treatment data as few studies reported 
follow-up data, with varied time-points, and only included outcomes 
that could be aggregated from a minimum of three studies. Where 
both treatment-as-usual (TAU) and active control group data were re-
ported, active control group data were used to compare with treatment 
group effects.

2.4. Risk of bias in individual studies

The quality of studies was assessed using the Clinical Trial Assess-
ment Measure (CTAM; Tarrier and Wykes, 2004), which has demon-
strated adequate inter-rater reliability, internal consistency and 
current validity in psychological intervention for psychosis trials 
(Tarrier and Wykes, 2004). Two authors (SL and MF) independently 
conducted quality ratings for the included studies, with discrepancies 
resolved by discussion.

2.5. Synthesis of results

The primary outcome was the overall severity of psychotic symp-
toms. Secondary outcomes were positive and negative symptoms, hal-
ucination-related distress, delusion-related distress, depressive 
symptoms, and functioning and disability. Process variables relating to 
mindfulness, acceptance and compassion were also considered. Supple-
mentary analyses were conducted to determine the treatment effect on 
 psychotic symptoms for theoretically defined contrasts: therapy model 
(mindfulness-based vs acceptance-based vs compassion-focused); indi-
vidual vs group format; and comparison group (treatment-as-usual alone vs active control).

Study outcomes were expressed as Hedge’s g (bias-adjusted standar-
dised mean difference), which were calculated using end of 
treatment means and pooled standard deviations for treatment and 
control groups. Between-group effect size data were then synthesised 
using Comprehensive Meta-Analysis Version 3.0. A random effects 
model was used given expected differences between intervention pro-
tocols and study designs. Heterogeneity was tested using a χ2 test and 
the I2 statistic calculated, with 25%, 50% and 75% representing low, mod-
erate or high heterogeneity (Higgins et al., 2003). Publication bias was 
examined using both Rosenthal’s (1979) and Orwin’s (1983) fail-safe 
N (1979) methods.

2.6. Moderator analyses

Meta-regression was planned to assess whether the primary out-
come was affected by three continuous moderators: 1) study quality 
(CTAM score), 2) treatment duration in sessions, and 3) treatment dura-
tion in hours.

3. Results

3.1. Study selection

A total of 836 potentially relevant studies were identified and 
screened for inclusion. After removing duplicates 735 studies remained 
and the first author screened their titles and abstracts. Following review, 
699 studies were excluded that did not meet the inclusion criteria. A 
further 36 studies were selected for full-text evaluation (independently 
by SL and MF, with discrepancies resolved by NT). 22 did not meet 
inclusion criteria. Four studies required a more considered evaluation, 
and were subsequently excluded: 1) Bach and Hayes (2002) included 
rehospitalisation data only, which was not a pre-specified outcome, 2) 
Tyberg et al. (2016) reported outcomes for rehospitalisation and 
values-based living, 3) Chadwick et al. (2009) reported change scores 
Please cite this article as: Louise, S., et al., Mindfulness- and acceptance-based interventions for psychosis: Our current understanding and a meta-
analysis, Schizophr. Res. (2017), http://dx.doi.org/10.1016/j.schres.2017.05.023
only and we were not able to obtain usable data from the authors, and 4) Gaudiano et al. (2015) included participants mostly diagnosed with Major Depressive Disorder with psychotic features. Overall, 10 eligible studies were included; see the PRISMA flow diagram in Fig. 1 (see Supplementary material for study characteristics; Braehler et al., 2013; Chadwick et al., 2016; Chien and Lee, 2013; Chien and Thompson, 2014; Gaudiano, 2006; Langer et al., 2012; López-Navarro et al., 2015; Shawyer et al., 2012; Shawyer et al., 2016; White et al., 2011).

3.2. Study characteristics

The total sample included 624 participants, randomised to a third wave intervention (284) or a control condition (340). There was an average attrition rate of 9.15%. Included study intervention protocols comprised group-based MBI (5), individually administered ACT (4), and group-based CFT (1). Additionally, six of the included studies used a TAU or waitlist comparison, and four used an active control group: Psycho-education (Chien and Thompson, 2014), Integrated Rehabilitation Treatment (López-Navarro et al., 2015), or Befriending (Shawyer et al., 2012; Shawyer et al., 2016).

3.3. Risk of bias within studies

There was considerable variability in the methodological quality of studies (see Supplementary material). Based on CTAM criteria, four studies were considered to have less than adequate methodological quality and considerable risk of bias (≥65; Wykes et al., 2008).

3.4. Synthesis of results

A summary of the results and the forest plots for the primary outcome and significant secondary analyses can be seen in Table 1 and Fig. 2, respectively.

### 3.4.1. Primary outcome

The primary outcome analysis included studies that reported total psychotic symptom scores for the Positive and Negative Symptom Scale (PANSS; Kay et al., 1987), the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962), or the Clinical Global Impressions—Schizophrenia Scale (CGI-SCH; Haro et al., 2003). As seen in Table 1, analysis revealed a small, significant between-group post-intervention effect.

Planned sub-analyses for therapy protocol demonstrated a negligible and non-significant effect for studies using an (individual) ACT protocol, but a moderate and significant effect for (group-format) MBIs. When we considered effects on psychotic symptoms by the type of control group, a significant moderate effect was revealed when comparing intervention with TAU, but a small and non-significant effect was identified when contrasting with an active control group.
Secondary outcomes

Studies included in the analyses for positive and negative symptoms reported scores from the PANSS positive and negative scales. The analysis of hallucination distress used the hallucination distress-intensity and distress-amount item scores from the Psychotic Symptom Rating Scales (PSYRATS, Haddock et al., 1999). There were insufficient studies reporting delusion-related distress. Depression measures used included the Beck Depression Inventory-II (BDI-II; Beck et al., 1996) and the depression scale of the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). Functioning and disability measures included the Level of Functioning Scale (SLOF; Schneider and Bond, 1995), Social Functioning Scale (SFS; Birchwood et al., 1990) and the Sheehan Disability Scale (SDS; Leon et al., 1997).

Among the secondary outcomes we observed a moderate and significant small-to-moderate between-group post-intervention effect on depressive symptoms, but no significant effects on positive or negative symptoms, hallucination-related distress (intensity or amount), or functioning and disability.

Process measures

Mindfulness measures included the Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008), the Mindful Attention Awareness Scale (MAAS; Brown and Ryan, 2003) and the Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2004). Measures of acceptance included two versions of the Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011; AAQ-16; Hayes et al., 2004b). Insufficient studies reported on compassion for analysis. The analyses demonstrated a moderate and significant small-to-moderate between-group post-intervention effect on mindfulness, but only a negligible treatment effect for acceptance that did not reach significance.

Heterogeneity

Given the small number of studies in each analysis (3–8), p value of 0.10 was used to determine statistical significance for the χ² test (Higgins and Green, 2011). Low heterogeneity was observed for the primary analysis. Significant heterogeneity was found only for the sub-analysis of overall psychotic symptom effects in trials with active comparison conditions (moderate heterogeneity), and the secondary analysis of the treatment effect on functioning and disability (moderate heterogeneity).

3.6. Publication bias

Using Rosenthal’s (1979) fail-safe N publication bias method results indicated that 11 studies with null findings would be required to nullify the observed pooled treatment effect of the primary outcome. Similarly, Ouw’s fail-safe N method revealed that 37 studies with a mean Hedges’ g of zero would be required to render the pooled treatment effect of the primary outcome trivial in size (0.05; Ouw, 1981). Given the number of studies identified for inclusion, it is considered unlikely that 37 unpublished RCTs of third-wave interventions for psychosis exist.

4. Discussion

Ten studies of third-wave interventions for psychosis comprising 624 participants were included in this meta-analysis. Results suggest these interventions are efficacious for reducing overall psychotic symptoms, with a significant small-to-moderate between-group post-intervention effect identified. This effect size is of similar magnitude to effects reported in meta-analyses of CBTp (Jauhar et al., 2014; Wykes et al., 2008), the main established psychological intervention approach for psychosis. Effects on psychotic symptoms were not moderated by study quality or treatment duration, however, the meta-regression analysis was underpowered and caution should be taken when interpreting these findings. Overall, effect sizes were much smaller and were no longer significant when examining studies comparing treatment with an active control group. High levels of heterogeneity were observed in this analysis, which may reflect differences arising from the varied intervention protocols, control protocols and other methodological characteristics of these trials. Indeed, it is notable that effects were smallest in trials comparing with befriending as a comparison condition (Shawyer et al., 2012; Shawyer et al., 2016), which raises
Fig. 2. Forest plots for primary outcome and significant secondary analyses.

Please cite this article as: Louise, S., et al., Mindfulness- and acceptance-based interventions for psychosis: Our current understanding and a meta-analysis, Schizophr. Res. (2017), http://dx.doi.org/10.1016/j.schres.2017.05.023
the possibility that much simpler interventions may be equally effective in improving psychosis outcomes. Hence, overall, at this stage we cannot conclude that it is the specific components of third-wave interventions that contribute to effects, but addition of therapies to routine care appear efficacious in improving outcomes.

When studies were grouped by treatment protocol, the observed ef- fect on psychotic symptoms appeared specific to the interventions that involved MBIs, with ACT trials showing negligible, non-significant treat- ment effects. It should be noted that there was some interaction with trial methodology, with three of the four ACT trials involving compari- son with active controls. Nonetheless this raises the possibility that ACT may be relatively less effective than focused mindfulness interven- tions in promoting effective change in individuals with psychosis. This would be reflected as a lack of change on measures of mindfulness but not of acceptance. Considering cognitive challenges in this population, it is feasible that the more structured and focused ap- proach of mindfulness courses performed better, and/or that the com- plexity of different components of ACT, and the use of metaphors and abstract experiential exercises were more challenging. This would be consistent with qualitative feedback from some participants in one of the included ACT trials (Bacon et al., 2014). MBI trials also differed by in- volving group delivery, whilst ACT involved individual therapy. No studies examining the effects of a MBI for psychosis in individual format were identified during the study selection process. Given psychological interventions are most frequently delivered on an individual basis there is a key need to examine this delivery modality.

We also observed positive effects on depressive symptoms in individuals with psychosis, with moderate and significant effects observed. This is consistent with meta-analyses of mindfulness for depression in community samples (Khouw et al., 2013a), and is important given the prevalence of depressive symptoms in persons with persisting and recurrent psychosis, and their implications for quality of life.

On the other hand, analyses found no significant positive between-group post-intervention effects for positive and negative symptoms, hallucination-related distress, and functioning and disability. It should be noted that data for positive and negative symptoms were only avail- able for four studies, all using the PANS, three of which (López-Narros et al., 2015; Shwayer et al., 2012; Shwayer et al., 2016) showed low ef- fects across all measures. However, the absence of findings for more specific symptom domains suggests that the impact of third-wave intervention on general symptoms such as depression rather than on psychotic symptoms per se. It should be borne in mind that overall symptom severity measures provide relatively indirect measures of the intended outcomes of psycholog- ical interventions, rather than the more superficial therapeutic goals of reduced symptom-related distress or improved functioning (Thomas, 2015). Our chosen primary outcome provided a pragmatic means of pooling data from a number of trials. However, a limitation here is that third-wave interventions are clearly focused on the premise that distress results from ones responses to difficult experiences, rather than the experiences themselves (Hayes et al., 2006; Kabat-Zinn, 1994). Consequently, MBIs are designed to alleviate symptom related distress rather than reduce psychotic symptomatology. Hence estimates of the magnitude of effect from this meta-analysis should be considered only an indirect index of efficacy. Even on the PSYRATS items that more di- rectly index symptom-related distress, large clinical changes are re- quired to show improvements (Thomas, 2014). It should be noted that the largest BQPS study reporting on hallucination-related distress also failed to find an effect on this measure (Birchwood et al., 2014), raising the possibility of measure insensitivity. This highlights a need to develop and validate more appropriate outcome measures. Ours, which assess the emotional and functioning impact of psychotic experiences, are in line with third-wave aims, and advocated by the recovery movement. Such efforts to do so are currently underway (e.g., the Voice Impact Scale; Strauss, 2016).

5. Conclusion

In sum, findings from RCTs indicate third-wave interventions are ef- ficacious for the treatment of psychotic symptoms, and for the treat- ment of depressive symptoms in the context of psychosis. Significant between-group post-intervention differences on mindfulness are con- sistent with the suggestion that improved mindfulness is a potential mechanism of observed symptom change. Further RCTs using appropri- ate outcome measures are needed to further determine the effective- ness of third-wave interventions on the emotional and functioning impact of psychotic experiences.

Contributors
S.L., N.T., and S.R. contributed to the conception of the review. S.L. designed and performed the literature search. S.L. and M.P. screened articles for eligibility and extracted data from eligible studies. S.L. conducted the analysis and wrote the first draft of the manuscript. All authors contributed to and approved the final manuscript.

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Conflict of interest
None.

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Appendix A. Supplementary data
Supplementary data to this article can be found online at http://dx. doi.org/10.1016/j.schres.2017.05.023.

References


Appendix E: Authorship Indication Forms
Swinburne Research

Authorship Indication Form
For PhD (including associated papers) candidates

NOTE
This Authorship Indication form is a statement detailing the percentage of the contribution of each author in each associated 'paper'. This form must be signed by each co-author and the Principal Coordinating Supervisor. This form must be added to the publication of your final thesis as an appendix. Please fill out a separate form for each associated paper to be included in your thesis.

DECLARATION
We hereby declare our contribution to the publication of the 'paper' entitled:

First Author
Name: Neil Thomas
Signature: [Signature]
Percentage of contribution: 62%
Date: 16/08/17
Brief description of contribution to the 'paper' and your central responsibilities on project: Assisted with protocol design, study selection and data analysis.

Second Author
Name: [Name]
Signature: [Signature]
Percentage of contribution: [Percentage]
Date: [Date]
Brief description of your contribution to the 'paper':

Third Author
Name: [Name]
Signature: [Signature]
Percentage of contribution: [Percentage]
Date: [Date]
Brief description of your contribution to the 'paper':

Fourth Author
Name: [Name]
Signature: [Signature]
Percentage of contribution: [Percentage]
Date: [Date]
Brief description of your contribution to the 'paper':

Principal Coordinating Supervisor: Name: [Name]
Signature: [Signature]
Date: [Date]

In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.

Authorship Indicative Form 1 of 1
Swinburne Research

Authorship Indication Form
For PhD (including associated papers) candidates

NOTE
This Authorship Indication form is a statement detailing the percentage of the contribution of each author in each associated paper. This form must be signed by each co-author and the Principal Coordinating Supervisor. This form must be added to the publication of your final thesis as an appendix. Please fill out a separate form for each associated paper to be included in your thesis.

DECLARATION
We hereby declare our contribution to the publication of the paper(s) entitled:

Does mindfulness help people adapt to the experience of hearing voices?

First Author
Name: Stephanie Louise
Percentage of contribution: 75%
Date: 21/07/2013
Brief description of contribution to the paper and your control responsibilities on project: Revised literature, developed research questions, designed, screened and analysed data, interpreted results and prepared manuscript.

Second Author
Name: Susan Rosell
Percentage of contribution: 25%
Date: 18/08/2013
Brief description of your contribution to the paper:
Participated in overall study design, assisted in interpretation of results and critically reviewed manuscript.

Third Author
Name: Wai Lin Teh
Percentage of contribution: 62%
Date: 25/01/2013
Brief description of your contribution to the paper: Participated in overall study design, secured ethics, data collection and entry, and critically reviewed manuscript.

Fourth Author
Name: Monique Scott
Percentage of contribution: 38%
Date: 03/05/2013
Brief description of your contribution to the paper: Participated in overall study design, secured ethics, data collection and entry, and critically reviewed manuscript.

Principal Coordinating Supervisor: Name: Neil Thomas
Signature: __________________________
Date: 18/06/2013

In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.

1 of 1
Swinburne Research

Authorship Indication Form
For PhD (including associated papers) candidates

NOTE
This Authorship Indication Form is a statement detailing the percentage of the contribution of each author in each associated paper. This form must be signed by each co-author and the Principal Coordinating Supervisor. This form must be added to the registration of your thesis as an appendix. Please fill in a separate form for each associated paper to be included in your thesis.

DECLARATION
We hereby declare our contribution to the publication of the 'paper' entitled:

Continued

First Author
Name: Neil Thomas
Signature: 
Percentage of contribution: 62%
Date: 19/08/20

Brief description of contribution to the 'paper' and your overall responsibilities on project: Participated in overall study design and assisted in design of research questions, consulted during data analysis and interpretation of results, and critically revised manuscript.

Second Author
Name: 
Signature: 
Percentage of contribution: ____
Date: ___/___/___

Brief description of your contribution to the 'paper':

Third Author
Name: 
Signature: 
Percentage of contribution: ____
Date: ___/___/___

Brief description of your contribution to the 'paper':

Fourth Author
Name: 
Signature: 
Percentage of contribution: ____
Date: ___/___/___

Brief description of your contribution to the 'paper':

Principal Coordinating Supervisor
Name: 
Signature: 
Date: ___/___/___

In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.

Authorship Indication Form 1 of 1
APPENDIX E

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Authorship Indication Form
For PhD (including associated papers) candidates

NOTE
This Authorship Indication form is a statement detailing the percentage of the contribution of each author in each associated 'paper'. This form must be signed by each co-author and the Principal Coordinating Supervisor. This form must be added to the publication of your final thesis as an appendix. Please fill out a separate form for each associated paper to be included in your thesis.

DECLARATION

We hereby declare our contribution to the publication of the 'paper' entitled:

First Author
Name: Stephanie Louise
Signature: 
Percentage of contribution: 35%
Date: 27-01-2017
Brief description of contribution to the 'paper' and your central responsibilities/role on project: Developed intervention protocol, data collection, entry and analysis, reviewed literature, interpreted results, conducted ethics and funding, and prepared manuscript.

Second Author
Name: Susan Ross
Signature: 
Percentage of contribution: 15%
Date: 27-08-2017
Brief description of your contribution to the 'paper': Assisted with study design and interpretation of results, and critically revised manuscript.

Third Author
Name: Neil Thomas
Signature: 
Percentage of contribution: 15%
Date: 18-08-2017
Brief description of your contribution to the 'paper': Supervised intervention development, consulted during data analysis, assisted with interpretation of results, and critically revised manuscript.

Fourth Author
Name: 
Signature: 
Percentage of contribution: 
Date: 
Brief description of your contribution to the 'paper':

Principal Coordinating Supervisor: Name: Neil Thomas
Signature: 
Date: 18-08-2017

In the case of more than four authors please attach another sheet with the names, signatures and contribution of the authors.