

**Negative perseverative thought processes and psychosis:
The role of rumination in voice-hearing**

A thesis submitted to the University of Manchester for the degree of ClinPsyD in
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Samantha Hartley

School of Psychological Sciences

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List of abbreviations

ACT: Acceptance and Commitment Therapy

ANCOVA: Analysis of Covariance

ANTI: Anxious Thoughts Inventory

BABCP: British Association of Behavioural and Cognitive Psychotherapy

CAPS: Cardiff Anomalous Perceptions Scale

CBT: Cognitive Behavioural Therapy

CI: Confidence Interval

CIS-R: Clinical Interview Scale- Revised

CLG: Community Liaison Group

EPHPP: Effective Public Health Practice tool

ESM: Experience Sampling Methodology
GAD: Generalised Anxiety Disorder
GP: General Practitioner
GPTS: Green Paranoid Thoughts Scale
HADS: Hospital Anxiety and Depression Scale
LSHS: Launay Slade Hallucination Scale
MCQ: Metacognitions Questionnaire
NHS: National Health Service
NICE: National Institute for Health and Care Excellence
PANSS: Positive and Negative Syndrome Scale
PDI: Peters Delusion Inventory
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PSQ: Psychosis Screening Questionnaire
PSWQ: Penn State Worry Questionnaire
PSYRATS: Psychotic Symptom Rating Scale
PTQ: Perseverative Thought Questionnaire
PTSD: Post Traumatic Stress Syndrome
RCT: Randomised Controlled Trial
RRQ: Rumination and Reflection Questionnaire
RRS: Ruminative Response Scale
SD: Standard Deviation
SE: Standard Error
SPSS: Statistical Package for the Social Sciences
SSPS: State Social Paranoia Scale
TCQ: Thought Control Questionnaire

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Abstract

The University of Manchester

Candidate: Samantha Hartley

A thesis submitted to the University of Manchester for the degree of Doctor of Clinical Psychology in the Faculty of Medical and Human Sciences in July 2015.

Thesis title: Negative perseverative thought processes and psychosis: The role of rumination in voice-hearing

This thesis explored the role of negative perseverative processing in psychosis. The specific aims were twofold: to provide a contemporary, critical overview of the evidence for the role of worry and rumination in positive psychotic symptomatology, and to experimentally test the link between rumination and voice-hearing experiences. Paper one reports on a systematic review of the literature; collating, synthesising and critically evaluating the current literature relating to the associations between worry and rumination, and psychosis. A rigorous, theoretically-driven search produced 27 papers, the findings of which indicated a varied evidence base supporting a role for both worry and rumination in positive symptoms. A simple group-difference meta-analysis confirmed the importance of this line of enquiry, demonstrating that worry and rumination are higher in groups experiencing psychosis. Studies comprised a range of designs, populations and targets of investigation, offering insight into links with delusions, hallucinations and positive symptomatology more generally. The strongest evidence emerged for the links between worry and paranoia, with more and higher quality papers; although, support was also shown for links with rumination. Evaluating the field as a whole, a number of limitations were identified, including the preponderance of cross-sectional designs thus limiting inferences of causality and a relative dearth of research concerning rumination, despite similar theoretical drivers for its relevance. Paper two aimed to remedy aspects of these limitations, seeking to counter the largely cross-sectional body of work with a rigorous experimental test of the role of rumination in voice-hearing. Based on a continuum account of psychosis, previous evidence of feasibility and pragmatic practicalities, a student sample was recruited. The experimental design explored whether rumination following stressful film material resulted in a greater degree of auditory-hallucination type experiences, given anomalous perceptual information. Differences in distress, thematic convergence with the film content and state paranoia were also inspected. Randomly allocated to conditions, participants were instructed to either ruminate on the contents of a film depicting interpersonal violence, or distract themselves. The manipulation was successful with the former group exhibiting more perseverative thought. However, this was not accompanied by a significantly greater number of hallucination-type experiences, or level of distress. In the context of previous evidence, the work presented here seems to suggest that rumination might be more pertinently involved in the maintenance of distressing psychotic experiences, rather than their initial development. This is an important novel finding, which will guide future research efforts and provide information to target tailored intervention efforts appropriately.

Declaration

Statement

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

Previous work

The work reported here builds on that completed as part of the author's PhD thesis entitled, 'Anxious and depressive processes in psychosis'. Although there may be thematic overlap, the work presented here is original in its entirety; comprising a completely new, systemic literature review and novel experimental study.

Published work

This thesis is submitted in a format consisting of three papers; a systematic review, empirical study and reflective paper. Some of the sections soon will be published in peer-reviewed journals, in order to facilitate dissemination of the work. The systematic review is currently under review for *Clinical Psychology Review* and paper two is under review for publication in *Journal of Behavior Therapy and Experimental Psychiatry*. The papers are formatted in accordance with the journal author guidelines. However, within the thesis, references, section numberings and tables are presented in a consistent format to facilitate cross-referencing and readability.

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The Author

My first degree in Experimental Psychology at the University of Oxford sparked my research interests, including as it did numerous practical reports and a largely independent dissertation. Child behavioural research the University of Bangor, volunteering in India, community support work and a temporary research post at the University of Manchester followed, all of which helped to develop my clinical and research expertise. Managing a trial of Recovery-focussed therapy for psychosis, I learnt key skills in research planning, coordination and dissemination. Alongside this I completed a PhD and submitted my thesis in July 2012. A brief (weekend) lull between my PhD viva and starting the ClinPsyD left me tired but buoyed by the new challenge.

1. Worry and rumination in psychosis: a systematic review

Submitted for publication in *Clinical Psychology Review*

1.1 Abstract

Worry and rumination are negative thought processes often associated with increased experience of anxiety and depression, respectively. Theoretical models and empirical research have begun to highlight a role for them in the experience of psychosis, via a number of putative mechanisms. The current review aimed to systematically collate published research relevant to understanding the association between worry and rumination, and the experience of positive psychotic symptoms. Twenty-seven eligible studies were identified in total, which comprised a range of designs, types of experiences and measurement tools. All studies that examined group differences confirmed higher levels of worry and/or rumination in groups experiencing psychosis compared to non-clinical controls. Critical review revealed a preponderance of non-randomised, cross-sectional research although research into worry is relatively advanced in this regard. The evidence as it stands cannot confirm a causal role for worry and rumination but offers an insight into their importance and confirms the potential value of further rigorous study.

Key words: psychosis; schizophrenia; rumination; worry; delusion; auditory hallucination

1.2 Introduction

1.2.1 Psychological models of positive symptoms

Psychological models of psychosis have attempted to assimilate information regarding beliefs, thoughts, anomalous experiences and reactions to these (including distress and attempts to alleviate it). Morrison (2001) proposed that internal or external triggers arouse experiences that are misinterpreted as threatening, increasing negative mood and physiological arousal. These initial and subsequent misinterpretations might be guided by past experiences and belief structures. The experiences and the threat they engender are maintained by cognitive and behavioural reactions, such as safety behaviours, selective attention and thought control strategies.

Garety (2001) have also proposed a model which seeks to account for the occurrence and maintenance of both delusions and hallucinations, with two hypothesised developmental trajectories. The model supposes that, in predisposed individuals, triggers can lead to psychotic experiences via cognitive and affective changes and also by affective disturbance alone. Key cognitive processes include intrusions of unintended material due to a heightened influence of remembered content, alongside impaired self-monitoring leading to misattribution to alien forces. The model gives prominence to emotional changes, which develop in response to the trigger and then feed back into the anomalous experiences. Reasoning biases such as jumping to conclusions and attributing events to external sources, along with difficulties understanding others' intentions also contribute. The severity of these biases is augmented by the affective changes. Environmental factors are also involved, including childhood experience and deprivation.

1.2.2 Continuum accounts of psychosis

Traditionally, the very conceptualisation of psychosis has incorporated a disjoint from an otherwise shared reality. However, research evidence suggests that psychotic-like experiences are quite common in the general population, and there is accumulating support for a continuum model of psychosis (see Verdoux & van Os, 2002 for a review). Despite growing evidence, the precise shape of the distribution of experiences and their varying severity is unclear (Lawrie, Hall, McIntosh, Owens, & Johnstone, 2010; Linscott & van Os, 2010). If it is at least accepted that the impermeable delineation between psychotic and non-psychotic experience is false (whatever the precise nature of the distribution may be) then research (and thus reviews) in this area should include findings from non-clinical samples which demonstrate levels of experience below diagnostic thresholds.

1.2.3 Thought processes in psychosis

1.2.3.1 Transdiagnostic and ‘single symptom’ approaches

Traditional conceptualisations of mental health problems are based on clustering symptoms to form taxonomies of ‘disorder’, in which the endorsement of categories denotes the presence of a coherent and consistent group of experiences (American Psychiatric Association, 2013). Within this framework, there has been an inherent trumping of one disorder by another (for example, Foulds & Bedford, 1976), such that commonalities or parallel processes might be underplayed. Recent critical reviews have questioned the validity of separating categories of psychiatric problems, observing a lack of natural boundaries. However, the reviews also acknowledge that part of the utility of diagnostic systems might remain, based on the accumulated knowledge and evidence (Kendell & Jablensky, 2003). An alternative approach has been to focus instead on specific symptoms, with the hope that these are discernible with heightened validity and reliability, allied with the understanding that single symptoms might be driven by independent process, despite clustering together in ‘syndromes’ (Persons, 1986). This approach has

been particularly welcomed (by some) in the psychosis field, with research efforts now increasingly focussing on discrete experiences including paranoia (for example, Freeman, 2007) and voice-hearing (for example, Waters et al., 2012). Alongside this framework for experiences, a review of putative causal and maintenance mechanisms has delivered a number of transdiagnostic processes that are present, and seem influential, in the experiences of numerous divergent mental health problems (Harvey, Watkins, Mansell, & Shafran, 2004), with mounting evidence that they may have a particular role in the experience of psychosis.

1.2.3.2 Worry

Worry is ‘...a chain of thoughts and images, negatively affect-laden and relatively uncontrollable’ and is often characterised by repetitive thought about future threat (Borkovec, 1983). Importantly, in terms of its conceptualisation as a cognitive avoidance strategy (Borkovec, Ray, & Stober, 1998), it is predominantly a verbal, thought-based rather than image-based process (Borkovec & Inz, 1990; Borkovec et al., 1998). Implemented as a futile strategy to avoid the processing of emotionally-laden, aversive material, worry ultimately backfires and maintains distress (Borkovec et al., 1998).

Worry is inherently linked with generalised anxiety disorder (GAD); it is a key diagnostic feature (American Psychiatric Association, 2013) and exacerbates anxious mood (Gana, Martin, & Canouet, 2001). However, rooted in transdiagnostic accounts (Harvey et al., 2004), worry has additional qualities and consequences that highlight it as a wide-ranging and influential thought process, with mounting evidence that it has implications for the experience of psychosis. Worry is associated with increased intrusions (Wells & Papageorgiou, 1995) and perceptions of threat (Belzer, D’Zurilla, & Maydeu-Olivares, 2002; Stapinski, Abbott, & Rapee, 2010), alongside a reduced ability to disengage attention and suppress thoughts (Becker, Rinck, Roth, & Margraf, 1998; Verkuil, Brosschot, Putman, & Thayer, 2009), diminished working memory performance and social problem solving (Belzer et al., 2002; Crowe, Matthews, & Walkenhorst, 2007).

1.2.3.3 Rumination

Rumination can be described as ‘class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts’ (Martin, Tesser, & Wyer Jr, 1996; p.7). It has been highlighted as a key process in depression (Broderick & Korteland, 2004; McMurrich & Johnson, 2008; Nolen-Hoeksema & Morrow, 1993; Spasojevic & Alloy, 2001) and when conceptualised as a response to this affective state, it reflects ‘behaviors [sic] and thoughts that focus one’s attention on one’s depressive symptoms and on the implications of these symptoms’ (Nolen-Hoeksema, 1991; p1). More broadly, rumination is composed of elements of reflection and brooding, with the latter bearing most of the maladaptive influence (Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

Rumination is associated with increased intrusions (Lyubomirsky, Kasri, & Zehm, 2003; Watkins, 2004), a more negative interpretation of events, the self, the past and future (Donaldson & Lam, 2004; Lavender & Watkins, 2004; Mellings & Alden, 2000; Park, Goodyer, & Teasdale, 2004; Rimes & Watkins, 2005), and an increased tendency to avoid cognitive events and real-life situations (Cribb, Moulds, & Carter, 2006). Alongside this, there is a more general reduction in executive processing capacity (Watkins & Brown, 2002) and detrimental effects on concentration (Lyubomirsky et al., 2003).

1.2.3.4 Worry and rumination: overlap, divergence and relevance for theories of psychosis

Worry and rumination are both examples of negatively-valenced repetitive thought processes (McLaughlin, Borkovec, & Sibrava, 2007), which are also a central part of the Cognitive Attentional Syndrome evidenced to be instrumental in many emotional disorders. This syndrome is defined within the Self-Regulatory Framework (Wells & Matthews, 1996), which posits that worry and rumination are utilised due to positive beliefs regarding their perceived utility and, once instigated, they divert attentional resources, increase negative

affect and activate concurrent negative beliefs about their effects, which exacerbates the impact. Even outside this particular theoretical framework, their influence is wide-ranging (Harvey et al., 2004).

Despite their overlap conceptually and theoretically, the convergence of worry and rumination is not sufficient to undermine their delineation (Segerstrom, Tsao, Alden, & Craske, 2000). The two also diverge in the focus of the thoughts (future versus past) and their links with anxiety and depression, respectively (Hong, 2007; Watkins, Moulds, & Mackintosh, 2005). As outlined above, both class of thought process result in numerous consequences, each of which may be relevant in the experience of psychosis, including increased negative affect, an increased attention to or interpretation of threat, increased cognitive intrusions and a tendency towards avoidance strategies; all of which have been cited in evidenced psychological models of psychosis (Morrison, 2001; Garety, 2001). Moreover, both processes seem to be related to a diminished ability to solve problems and recruit executive resources. A number of authors have already attempted to provide a focus to these research efforts, proposing specific models that incorporate the influence of worry and rumination on the experience of delusions (Freeman, 2007) and auditory hallucinations (Jones & Fernyhough, 2009), offering an avenue for experimental explorations of the hypothesised relationships therein. As yet, these investigations are based on a diffuse literature, which may benefit from critical synthesis to inform future empirical efforts.

1.3 Aims of the current review

The aim of the current review was to elucidate the associations between worry, rumination and positive psychotic symptomatology by collating and critically appraising the current research evidence for a role for these processes in the experience of psychosis. The search and therefore results focus on positive symptomatology as these are often seen as the hallmark of psychosis; studies which reported exclusively on links with ‘negative’ or ‘general’ symptomatology (as delineated in the Positive and Negative Syndrome Scale; PANSS; Kay, Opler,

& Fiszbein, 1987) were not included. ‘Associations’ encompassed both bivariate relationships and links implied by differences between groups, in order to maximise the amount of relevant information included. Based on a continuum model of psychosis (Johns et al., 2004; Johns & van Os, 2001; van Os et al., 1999), studies which used both clinical and sub-clinical groups were sought, with any divergence and the implications of this discussed in due course.

1.4 Method

1.4.1 Eligibility criteria, search strategy and procedure¹

Using the University of Manchester Library Ovid Search platform, the Psych Info, PubMed and Embase databases were searched utilising the All fields ‘AND’ function. Search terms were selected to represent experiences of psychosis (psychosis; psychotic; schizo*; “unusual belief”; voices; delusion; hallucination), and thought processes (worry; worrisome; ruminati*), with each bivariate combination search performed and results from all of these combined using the ‘OR’ function, with duplicates subsequently removed. Papers were included if they: examined the relationship between perseverative processing style and psychosis/ positive psychotic symptoms (i.e. association or relevant group difference); involved a clinical or subclinical group experiencing psychosis; used a quantitative measure of positive psychotic symptomatology and worry or rumination; were written in the English language, were journal articles between 1990 and March 2015. Papers were excluded if they were reviews of the literature or reported solely on a case study.

1.4.2 Search results, paper screening and data extraction

Figure 1 shows the full search process, in line with PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). Once 213 duplicates were removed, abstracts were screened for relevance and eligibility in line with the above criteria. Following this, the full texts were reviewed and reference lists of these papers examined for any additional manuscripts not identified in the original search. Key authors of those papers identified were also contacted and asked if

¹ The details of the search strategy are reflected on in paper three, section 3.3.1

any relevant papers had been missed; there were five replies. This process resulted in a total of 27 papers for inclusion. Papers were reviewed and data extracted using a standardised form incorporating details on sample, design, measures, analyses and findings.

1.4.3 Reliability

During the search and screening, any disagreements were resolved within the broader research team. In order to assess the reliability of the systematic review process, the process was partially replicated by an independent volunteer. Ten percent of the abstracts and 10 percent of the full papers identified in the search were randomly selected and subject to review. The decisions made by the current author and the independent reviewer were compared and Cohen's Kappa analysis used to assess the level of inter-rater reliability. At the abstract level, Kappa= .658 ($p<.001$); at the full paper level Kappa= 1.00 ($p<.001$), which indicates substantial and almost perfect agreement, respectively (Landis & Koch, 1977). Importantly, papers in the abstract search that did not show consistency in ratings did show consistency at the next stage (i.e. disagreement at abstract stage did not imply a change in inclusion or exclusion of a paper in the final selection).

1.4.4 Quality assessment²

There is a need for papers included in a systematic review to be assessed using standardised tools in order to appraise their methodological quality, which should subsequently influence the critical evaluation of the findings produced. There is a distinct lack of assessment tools that fulfil both the need to be demonstrably reliable and valid and also appropriate for use with non-intervention studies, as inevitably constitutes the majority of the papers identified in the current review. Based on a previous review of quality assessment tools (Deeks et al., 2003), the Effective Public Health Practice tool (EPHPP; B. H. Thomas, Ciliska, Dobbins, & Micucci, 2004) was selected as one that could offer valid (B. H. Thomas et al., 2004), reliable (Armijo-Olivo, Stiles,

² The quality assessment tool is critically reviewed in more depth in section 3.3.2 of the reflective paper

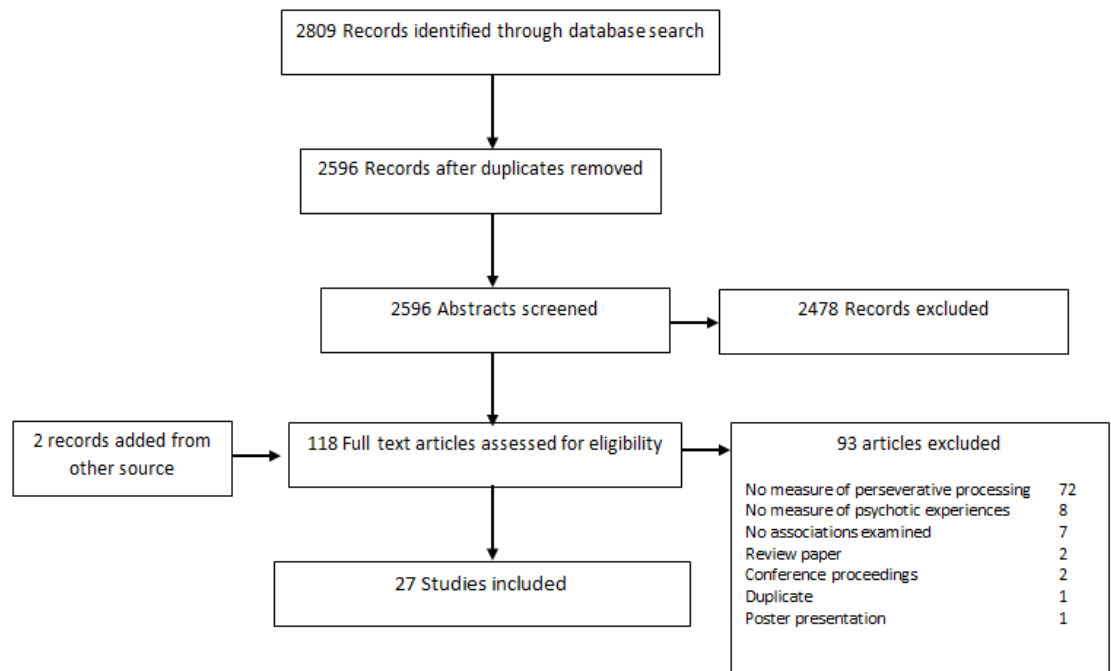
Hagen, Biondo, & Cummings, 2012) and flexible appraisal of varying study designs. The full tool can be seen in appendix 1. Utilising this flexibility, the current review employed both the standard application of the tool, incorporating ratings of A) selection bias; B) study design; C) confounders; D) blinding; E) data collection and F) withdrawals, alongside an adapted rating including only those aspects applicable to non-intervention studies (components A, C and E; as used in Davies et al., 2013; Mirza, Fitzpatrick-Lewis, & Thomas, 2007). The results of both methods of assessment are reported in order to permit the reader similar flexibility in interpretation; see Table 1. The reliability of the quality assessment was assessed using a random sample of 20% of the papers, which were rated by an independent researcher, producing a kappa reliability estimate of .888 ($p \leq .001$).

1.4.5 Meta-analysis

Following provisional review of the included papers' study designs and range of measures used, it became clear that there was considerable heterogeneity in both aspects, with studies using group comparisons, longitudinal and cross-sectional designs, focusing on a range of psychosis-related experiences (paranoia, voice-hearing, delusional beliefs, positive symptoms) and associated measurement tools. This fits with the review's aim to provide a broad overview of the field as it currently stands; although, it is not conducive to fine-grained meta-analyses. Notwithstanding this, the current review offered the opportunity to synthesise information on the level of worry and rumination in clinical as opposed to non-clinical groups, which would provide confirmation of the relevance of these constructs in the context of psychosis. This was achieved using random-effects meta-analysis following the DerSimonian-Laird method (DerSimonian & Laird, 1986), which was preferred given the expected heterogeneity (Higgins & Thompson, 2004). This produced standardised mean difference scores for worry and rumination separately utilising data from studies that reported the mean and standard deviation of scores on these measures in both clinical and non-clinical groups. The analysis was conducted in Stata (Version 13) and utilised the metan command; the results of the meta-analysis are presented below. Heterogeneity was examined using the chi-

squared test for significance, with the scale of this determined by τ and I^2 statistics (Borenstein, Hedges, Higgins, & Rothstein, 2011; Higgins & Thompson, 2002; Higgins, Thompson, Deeks, & Altman, 2003)

Figure 1: Search process and results



1.5 Review findings

1.5.1 Summary

A summary of the relevant measures, methodological details and overall quality assessment ratings of the included papers can be found in Table 1. Additional detail regarding the quality assessment results can be seen in appendix 2.

1.5.2 Worry

A total of 20 papers reported analyses involving a measure of worry, including five studies comprised of clinical samples (Foster, Startup, Potts, & Freeman, 2010; Freeman et al., 2015; Freeman & Garety, 1999; Freeman et al., 2013; Hartley, Haddock, Vasconcelos e Sa, Emsley, & Barrowclough, 2014), eight with both clinical and non-clinical samples (Badcock, Paulik, & Maybery, 2011;

Bassett, Sperlinger, & Freeman, 2009; Bell, Halligan, Pugh, & Freeman, 2011; Freeman, Pugh, Vorontsova, Antley, & Slater, 2010; Morrison & Wells, 2000, 2007; Startup, Freeman, & Garety, 2007; Vorontsova, Garety, & Freeman, 2013), and seven describing research undertaken solely with non-clinical groups (Flower, Newman-Taylor, & Stopa, 2015; Freeman, Brugha, et al., 2010; Freeman, Gittins, et al., 2008; Freeman et al., 2011; Freeman, Pugh, et al., 2008; Freeman et al., 2012; Taylor, Graves, & Stopa, 2009). The links between worry and delusional experiences were recorded in 17 papers, making this the largest body of work within the current review. The predominant measure used was the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) and the studies were mostly UK-based. Not surprisingly, given its pervasiveness in the literature (Freeman & Garety, 2014), the overwhelming majority of these analyses focussed on persecutory delusions or paranoia.

In the earliest study investigating the links between worry and delusional experience, Freeman and Garety (1999) highlighted the high levels of worry in participants currently experiencing paranoid beliefs. However, correlation analyses did not find a significant relationship between trait levels of worry (as measured by PSWQ, Meyer et al., 1990) and delusional distress, preoccupation or conviction. Although these findings seem to undermine the role for worry in the experience of paranoia, the small sample sizes in this initial exploratory study (n=15) reduce the statistical power for detecting effects. Indeed, exploring the same relationships, with the addition of a more standardised assessment of delusional experience (The Psychotic Symptom Rating Scales; PSYRATS, Haddock, McCarron, Tarrier, & Faragher, 1999) and a larger sample, Startup, Freeman and Garety (2007) noted significant correlations between trait worry and delusional preoccupation, distress, although not conviction, mirroring similar findings from Bassett, Sperlinger and Freeman (2009). Focussing on specific aspects of worry using the Anxious Thoughts Inventory (ANTI; Wells, 1994), Morrison and Wells (2007) explored the links between social and health worry and delusional experiences in a group of 50 participants meeting criteria for a schizophrenia spectrum diagnosis. Correlational analyses revealed that social and health worry were related to

facets of delusional severity and distress, and for social worry, the association with distress was independent of the link with severity, which may be indicative of overlapping processes between social worry and delusional ideas. Although, broadly these studies suggest a meaningful link, the cross-sectional nature renders conclusions regarding causality inappropriate, and the small sample sizes limit generalizability.

In addition to findings relating to cross-sectional relationships, several studies have demonstrated that levels of worry distinguish between those experiencing delusional ideas and those not. Bassett et al. (2009) and Startup et al. (2007) both reported that levels of worry were significantly higher in those experiencing persecutory delusions compared with a non-clinical control group, with the groups matched on key demographic variables, thus reducing the potential for confound. The studies diverge in their use of mixed diagnostic groups (Startup et al., 2007) and those with schizophrenia-spectrum diagnoses (Bassett et al., 2009), emphasising the value in single-symptom, transdiagnostic approaches. Although the small sizes (≤ 30) reduce the generalisability of the findings, these studies seem to suggest the possibility that levels of worry and paranoia go hand in hand. There is also the indication that worry, when conceptualised as a strategic attempt at thought control, is more prevalent in sub-clinical samples showing high levels of paranoia (Flower et al., 2015), offering some insight into potential motivation for worrying in this context. Using two non-clinical groups (defined by high and low levels of paranoia) and a clinical group (with current persecutory delusions), Freeman, Pugh, Vorontsova, Antley and Slater (2010) demonstrated that there might be a stepwise relationship, with the group comparison revealing the highest levels of worry in those with clinical levels of paranoia, versus those with higher sub-clinical levels, versus those with low levels. In the context of a continuum account of psychosis, the split between these groups might be considered largely arbitrary; defined as a percentile split of the whole sample. However, unlike the previous two studies, Freeman et al. (2010) do make an attempt to control for potentially confounding clinical variables, utilising an ordinal logistic regression to compare the clinical groups while controlling for levels of

depression, anxiety and additional factors, with worry not emerging as a significant independent predictor, implying that there may be complex mediating or moderating mechanisms at work. Vorontzova, Garety and Freeman (2013) build on this by demonstrating that those experiencing both persecutory ideas and depression score higher on measures of worry compared to those experiencing paranoia alone, indicating that depression might be a key confounding variable. Taken as a whole, these findings do seem to indicate that trait levels of worry can distinguish between levels of paranoid thought; although, there appears to be strong suggestions that other cognitive and affective factors have prominence in these relationships and the primacy of causal influence cannot be deduced from cross-sectional studies.

Longitudinal investigations and those that manipulate levels of worry might offer some insight into the causal influence of worry on the experience of delusions. Startup et al. (2007) followed up participants experiencing persecutory delusions after three months, with change in delusional intensity and distress (derived from overall scores on the PSYRATS; Haddock et al., 1999) correlated with baseline levels of worry; thus, indicating that worry might be involved in the maintenance of paranoia. This finding has been replicated over six month follow up (Vorontsova et al., 2013), although controlling for other constructs (negative schema, problem solving), worry did not emerge as a significant independent predictor. The lack of significance after these controls underlines the need to explore possible interactions with other psychological variables. Utilising a longitudinal, momentary measure approach (Experience Sampling Methodology; ESM, Palmier-Claus et al., 2010), a recent study (Hartley et al., 2014) showed that worry in the preceding time period (both proximal and lagged) was significantly related to both persecutory ideation and distress in those currently symptomatic. Both of these papers indicate that worry may be influential in the maintenance of paranoia, though possible mediators of this relationship (such as anxiety) were not always explored and there are indications that other variables might account for the relationship.

The experimental or therapeutic manipulation of worry and its subsequent effects on delusional ideation might offer the most robust evidence

of a causal link. Freeman et al. (2013) recruited people meeting criteria for a schizophrenia spectrum diagnosis who were also experiencing both persecutory ideation and clinically significant levels of worry (a score of above 44 on the PSWQ; Meyer et al., 1990) and randomly allocated them to receive a worry induction (involving a catastrophising procedure), a worry reduction (mindfulness; Kabat-Zinn, 2006), or a neutral condition. Using a state measure of non-hallucinatory anomalous experiences (The Cardiff Anomalous Perceptions Scale; CAPS, Bell et al., 2011), the authors demonstrated that these were higher for the worry induction and neutral condition compared to the worry reduction, even after trait levels of symptoms were controlled for (using the total score from the Positive and Negative Syndrome Scale; PANSS, Kay et al., 1987). Given the lack of significant difference between the neutral and induction procedures, an appropriate conclusion based on these findings might be that worry is involved in the maintenance of paranoia (and therefore manipulating worry could be therapeutic) but worry is less active in the short-term development of persecutory ideas.

The therapeutic manipulation of worry was trialled by Foster, Startup, Potts and Freeman (2010) with a group of people experiencing paranoia and clinically significant levels of worry (45 or more on the PSWQ; Meyer et al., 1990). Targeting worry using a range of evidence-based techniques, the authors demonstrated that the change in levels of worry correlated with changes in persecutory thoughts post-treatment, and with paranoia distress and frequency over an extended follow-up period. Despite the small sample, this seems to suggest that worry might have causal influence on the level of delusional ideation. However, there were differences between the groups at baseline (the intervention group had higher levels of worry and paranoia) and the therapist took the role of outcome assessor, each of which may have inflated the size of the effects. Addressing these points, the randomised controlled trial of a worry intervention has recently been completed with a group of people with a schizophrenia spectrum diagnosis and experiencing paranoia. Freeman and colleagues (Freeman et al., 2015) delivered a six-session modularised, guided intervention over eight weeks targeting various worry beliefs and processes,

negating to challenge delusional beliefs directly. Analysis of the outcome data demonstrated that the worry intervention reduced both worry and paranoia. Most strikingly, mediation analysis showed that for each unit reduction in the worry factor, the delusions factor also reduced by 0.27; a significant mediation effect. This is the strongest evidence to date that worry is causally related to the experience of paranoia. Moreover, the effects were not specific to certain therapists or confounded by baseline levels of worry or delusions and the uptake of the sessions was high, indicating that intervening with worry processes alone might be a viable approach for therapeutic efforts in psychosis. One caveat is that both Freeman et al. (Freeman et al., 2015) and Foster et al. (Foster et al., 2010) preselected those with high levels of worry, which fits with a formulation-driven approach that would be appropriate in a therapeutic setting but might reduce the generalizability of the findings to other groups.

Looking exclusively to non-clinical populations, several studies have demonstrated links between levels of delusional ideation and worry. Conceptualising worry as a thought control process, it has been shown to relate to levels of paranoia in a general population sample (Taylor et al., 2009). However, multivariate analyses by the same authors demonstrated that this link is not evident when levels of depression and anxiety are controlled for, suggesting that these emotional states might confer the significance of the association. Using data from large national psychiatric surveys ($n > 7000$), Freeman and colleagues (Freeman, Brugha, et al., 2010; Freeman et al., 2011; Freeman et al., 2012) explored the relationship between worry and paranoia experience in the general population. Employing a rudimentary assessment of worry and a paranoia symptom count as outcome, Freeman et al. (Freeman, Brugha, et al., 2010) showed worry to be a significant predictor of paranoia even after controlling for key demographic variables (age and sex). Building on this using a multinomial paranoia outcome, Freeman et al. (Freeman et al., 2011) demonstrated that the presence of worry (scoring 2 or above on a four point scale) led to a significantly greater chance of each incremental level of paranoia and almost nine times greater likelihood of the highest level of paranoia, suggesting that the presence of worry confers a greater chance of also

experiencing paranoia. However, the lack of delineation of the cognitive and emotional aspects of experience means that the distress felt as a result of this experience has not been explored, and the lack of control variables mean that confounding influences cannot be disregarded. Both of these studies indicate that worry is related to the severity of paranoia in non-clinical samples, although the cross-sectional nature means that conclusions regarding causality cannot be drawn. As with clinical populations, longitudinal research might offer more insight into causal relationships. Using follow-up data from the 2000 British National Psychiatric Survey, Freeman and colleagues (Freeman et al., 2012) applied a logistic regression analysis and showed that worry at baseline was predictive of both new paranoid thinking and the persistence of paranoia. Furthermore, these relationships were unaffected by the inclusion of age, sex, ethnicity, education, and significant relationships as control variables. In addition, subgroup analyses including only those with no evident paranoia at baseline, showed that worry predicted endorsement of the key paranoia item at follow-up. This finding suggests that worry has a role in the inception and maintenance of paranoia and might confer vulnerability to its development. Nevertheless, the limited number of items used for measurement means that the nature of the constructs under scrutiny and therefore the precise quality of the relationships is limited.

Experimentally inducing paranoia in a non-clinical sample, Freeman et al. (Freeman, Pugh, et al., 2008) assessed levels of state paranoia and trait worry and found that worry was a significant predictor of state paranoia. This implied that worry might render individuals vulnerable to other factors (such as reasoning biases) that contribute to the development of persecutory ideas. The logistic regression model used also controlled for demographic data, reducing the likelihood of spurious relationships as a result of confounding factors. Building on this data, Freeman et al. (Freeman, Gittins, et al., 2008) attempted to explore the level of specificity for worry's influence on experiences associated with paranoia induction. Again employing state paranoia induction techniques, the authors examined whether worry differentially predicted paranoia or social anxiety. Results of the logistic

regression analyses demonstrated that this was not the case, indicating that worry might confer a general vulnerability to the experience of negative social experiences but not specifically paranoia. It might be that other factors are instrumental in this link, such as the tendency to perceive anomalous experiences, or jump to conclusions, which operate in orchestra with worry to produce persecutory ideas and distress.

Summarising the large body of findings relating to delusional experience; the evidence demonstrates that worry is cross-sectionally related to aspects of paranoia (Bassett et al., 2009; Startup et al., 2007), with negative findings possibly related to small sample sizes (Freeman & Garety, 1999). There may be a particular role for social worry (Morrison & Wells, 2007), and links were found with many aspects of paranoia. However, lack of significance for links with conviction levels suggests that other processes might drive beliefs processes (such as jumping to conclusions; Fine, Gardner, Craigie, & Gold, 2007). A number of studies provided data showing that those experiencing delusional ideas or paranoia score more highly on measures of worry (Bassett et al., 2009; Freeman, Pugh, et al., 2010; Startup et al., 2007), suggesting that the two might be related, although not necessarily independent of affective processes (Freeman, Pugh, et al., 2010; Vorontsova et al., 2013). Longitudinal, experimental and repeated-assessment studies have also revealed that worry may contribute to the maintenance of delusional experience, rather than simply co-exist with it (Freeman et al., 2013; Startup et al., 2007; Vorontsova et al., 2013; Hartley et al., 2014), although again there may be confounding factors. Perhaps the strongest evidence for the role of worry in the experience of delusions is that therapeutic intervention that reduces worry also reduces paranoia, with the levels of change linked (Foster et al., 2010; Freeman et al., 2015). Research with non-clinical samples has also replicated findings related to cross-sectional and longitudinal links (Freeman, Brugha, et al., 2010; Freeman et al., 2011; Freeman et al., 2012; Taylor et al., 2009), demonstrating a role in the experience of experimentally-induced paranoia (Freeman, Pugh, et al., 2008), although the latter might in fact represent a more general negative social experience (Freeman, Gittins, et al., 2008).

Research efforts investigating the relationships between worry and the experience of hallucinatory phenomena have been comparably limited, with the current review identifying five papers of relevance, two with clinical groups and three utilising both clinical and control samples. Exploring the relationships between voice-hearing and worry, Badcock et al. (2011) assessed people meeting criteria for schizophrenia spectrum diagnoses who also reported current auditory hallucinations. The results demonstrated that worry was not related to the severity or distress associated with voice-hearing, despite it being elevated in the patient as opposed to control group. It might, therefore, be concluded that the higher levels of worry in the clinical group are linked (in either causal direction) with other cognitive, emotional or psychotic phenomena (such as anxiety, delusional ideas), rather than hallucinatory experience. Again, using clinical and non-clinical populations and delineating worry contents using the ANTI, Morrison and Wells (2007) showed that neither health nor social worry were related to hallucinatory experience. Alternatively, when hallucinatory phenomena were conceptualised as anomalous experiences, worry can be shown to be significantly related to the distress, intrusiveness and frequency of these perceptions, thus indicating that it may be more relevant for subclinical phenomena in both clinical and non-clinical populations (Bell et al., 2011). When worry is manipulated (either reduced or maintained) in those experiencing paranoia, it does not affect the level of hallucinatory experience (Freeman et al., 2013), which reduces support for any causal role. In contrast, findings for clinical groups currently experiencing positive symptoms, demonstrated that momentary levels of worry did predict subsequent auditory hallucinations severity and distress (Hartley et al., 2014). Given that the previous studies did not pre-select for current symptomatology, it may be that worry is only a relevant factor for hallucinatory experience when these phenomena are already problematic; worry may be a reactionary strategy that augments or maintains experiences.

Looking at more general links between worry and psychosis, Morrison et al. (2000) compared a group of people meeting criteria for schizophrenia-spectrum diagnoses and a non-patient control group. Conceptualising worry as

a thought control strategy, the authors demonstrated that worry was significantly more evident in the patient group. The small group sizes (n=22 in each) reduce the generalizability of the findings, although the authors did make attempts to match the groups on demographic variables, thus reducing possible confounding influences. An appropriate conclusion might be that those who develop psychotic symptoms are historically more inclined to use worry as a thought control strategy, which backfires (Wegner, Schneider, Carter, & White, 1987). In turn, this increases the chance of experiencing distressing phenomena that warrant clinical interventions and labelling. However, the nature of the data does not allow us to rule out the possibility that worry is employed as a thought control strategy as an attempt to ameliorate experiences that are already present.

1.5.3 Rumination

A total of 10 papers reported analyses involving a measure of rumination, including two studies comprised of clinical samples (Halari et al., 2009; Hartley et al., 2014), four with both clinical and non-clinical samples (Badcock et al., 2011; Ricarte, Hernández, Latorre, Danion, & Berna, 2014; Rowland et al., 2012; Vorontsova et al., 2013), and four describing research undertaken solely with non-clinical groups (Carse & Langdon, 2013; Jones & Fernyhough, 2009; Martinelli, Cavanagh, & Dudley, 2013; Melo & Bentall, 2010). It is clear that rumination has been subject to relatively little evidential enquiry, when compared to worry, despite there being similar theoretical justifications for its relevance in the experience of psychosis. The predominant measure used was the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991), with more diversity in the research groups contributing to the field, as compared to papers exploring worry and psychosis.

Five papers report on findings relating to rumination and the experience of delusional ideas (Carse & Langdon, 2013; Hartley et al., 2014; Martinelli et al., 2013; Melo & Bentall, 2010; Vorontsova et al., 2013), four of which focussed on persecutory ideation. Vorontsova et al. (2013) used a split clinical group to demonstrate that rumination was highest in those with persecutory delusion and concurrent depression, as opposed to those with paranoia but no

depression, demonstrating that the link between the two might be due to levels of negative affect rather than necessarily psychosis-specific processes. The same authors also demonstrated that paranoid thoughts at 6-month follow up were not significantly related to baseline levels of rumination, suggesting that this process is not prominent in the maintenance of delusional ideas. Contrary to this, Hartley et al. (2014) utilised a repeated momentary assessment method to discern that rumination in the preceding time frame was significantly related to both the severity of persecutory ideation and the distress associated with it, which seems to suggest ruminative thought is a relevant factor in the maintenance of paranoia. However, the effects of concurrent depression on this relationship were not explored; therefore, the potential for negative affect to hold the explanatory power cannot be ruled-out.

Looking to non-clinical studies, Melo et al. (2010) used a large (n=600) non-UK sample to establish rumination as a significant predictor of levels of persecution as assessed by the persecution and deservedness scale (PaDS; Melo, Corcoran, Shryane, & Bentall, 2009). The authors utilised a regression model to control for various potentially confounding variables (age, gender, depression, coping styles) and found that the influence of rumination on sub-clinical paranoia was independent of demographic variables and, pertinently, depressive symptoms. Delusional ideation is a multi-faceted phenomena (Garety & Helmsley, 1997), and so research exploring the potential links between rumination and varying aspects of experience is welcomed. Carse et al. (2013) investigated the relationships between rumination and subscales from the Peters Delusion Inventory (PDI; Peters, Joseph, & Garety, 1999), which assesses the presence of delusions alongside distress, conviction and preoccupation. The results from this study demonstrated that rumination was significantly associated with all aspects of sub-clinical delusional experience, and these relationships were independent of more general reflective processes (as assessed by the rumination and reflection questionnaire; RRQ, Trapnell & Campbell, 1999) and age. This seems to indicate that negatively-valenced perseverative processing may have a prominent, specific role in delusional ideation; although, the additional finding that reflective processes also

demonstrated this independent relationship indicates the need for further consideration.

The experimental manipulation of rumination might supplement findings and offer more insight into a potentially causal role for perseverative processing in delusional experience. A recent study (Martinelli et al., 2013) explored the effects of induced-rumination on state levels of paranoia in a relatively small sample of undergraduate students ($n=37$). The results of the analysis of variance testing demonstrated a significant interaction between rumination condition and time, indicating that experimentally-induced paranoia was maintained by experimentally-induced rumination. Naturally-occurring levels of trait preservation and paranoia were also correlated. This seems to indicate that rumination might have a role in the development of paranoia; although, in line with the study design, this is better conceptualised as the maintenance of persecutory ideas, for which these findings offer strong support.

Three studies identified by the current review elicited evidence relating to associations between rumination and auditory hallucinations. There is evidence that rumination is higher in those meeting criteria for a diagnosis of schizophrenia who are also hearing voices, as compared to non-clinical controls (Badcock et al., 2011). Exploring the relationship more explicitly, Badcock et al. (2011) demonstrated that rumination correlated specifically with the distress associated with voice-hearing, although not the severity of symptoms (conceptualised within the PSYRATS as frequency and duration), suggesting that negative perseverative thinking might augment the detrimental impact of experiences rather than drive their development. Findings from an experience sampling study (Hartley et al., 2014) also point to a role for rumination in the maintenance of experiences, with levels over the previous time period associated with current severity and distress of voice-hearing in those with established active psychotic experiences. Confounding influences were not explored in this study and the sample size was not sufficiently powered, which therefore limits the generalizability of results.

The mechanisms by which ruminative processing might result in more prolific, invasive or distressing auditory experiences has not been fully elucidated. There is a potential role for mediation via depressive affect, arousal levels, intrusive thoughts or responsiveness to threat. A large study (n=296; Jones & Fernyhough, 2009) of student participants attempted to explore potential links utilising structural equation modelling, and thus offering a robust examination of the various relationships, while controlling for the confounding influences of age and gender. The results confirmed that rumination was related to voice-hearing experiences via increases in thought suppression and intrusive thoughts, suggesting that this type of perseverative processing might subsequently increase attempts to control thoughts and cause a paradoxical rebound of intrusions. However, the study remains cross-sectional in its design and therefore the longitudinal relationships underpinning these links are still unclear. Furthermore, an additional finding that reflection more generally was directly related to the experience of hallucinations indicates that attempts to delineate different types of perseverative self-focus might be warranted.

Two studies have evaluated the role of rumination in the experience of psychosis more generally. Comparing groups of individuals meeting criteria for schizophrenia, bipolar disorder and healthy controls and conceptualising rumination as an emotional regulation strategy, Rowland et al. (2012) investigated group differences while controlling for age. The results demonstrated that rumination strategies were significantly more prevalent in those with a diagnosis compared to healthy controls; although the two clinical groups did not differ. This seems to suggest that rumination may offer a more general vulnerability to extremes of mental distress, rather than specific psychotic symptomatology. Specifically, although the two clinical groups did not differ on levels of ruminative regulation, those meeting criteria for a schizophrenia diagnosis did (predictably) demonstrate higher scores on the PANSS (Kay et al., 1987) positive scores; therefore a lack of relation between positive symptoms and rumination could be deduced, although this specific link was not examined. Earlier work (Halari et al., 2009), however, did focus on this

link, applying a regression model with ruminative processing as the outcome and PANSS (Kay et al., 1987) subscales as independent predictors, using data from people meeting criteria for schizophrenia or schizoaffective disorder. The findings showed that the positive symptom subscale was not a significant independent predictor of level of rumination. Similar results have been reported (Ricarte et al., 2014) indicating that although levels of rumination differed significantly between those with a diagnosis of schizophrenia and a general population group, scores on the PANSS positive subscale did not correlate with scores on the rumination scale. This might undermine a role for rumination in the experience of psychosis; alternatively, it might underscore the need to delineate single experiences in order to chart specific links and avoid confounding multiple symptoms and thus masking significant independent links.

To summarise the findings in relation to rumination, the studies cited here have demonstrated that rumination is higher in those with persecutory delusions. However, the effect may be confounded by depression levels (Vorontsova et al., 2013). Rumination does not seem to maintain delusional ideation long term (Vorontsova et al., 2013) but does seem to be related to the short-term maintenance of persecutory experiences (Hartley et al., 2014; Martinelli et al., 2013). There is also evidence that rumination is related cross-sectionally to subclinical levels of delusions, and these links might be independent of demographic and affective factors (Carse & Langdon, 2013; Melo & Bentall, 2010). In terms of hallucinatory phenomena, rumination has been shown to be higher in those with a schizophrenia diagnosis, correlate with hallucinatory distress (Badcock et al., 2011) and be associated with symptom levels over short time periods (Hartley et al., 2014), with evidence that links with hallucinatory proneness may operate via thought suppression and intrusions (Jones & Fernyhough, 2009). More generally, rumination does not seem to differentiate people with a schizophrenia and bipolar diagnosis but is higher in clinical groups compared to controls (Rowland et al., 2012). Moreover, findings suggest that rumination is not significantly associated with general levels of positive symptoms (Halari et al., 2009; Ricarte et al., 2014),

demonstrating that research efforts focusing on specific experiences seem to have been more fruitful.

1.5.4 Meta-analysis

Seven studies provided data demonstrating the difference in worry scores between clinical and non-clinical populations (Badcock et al., 2011; Bassett et al., 2009; Freeman et al., 2005; Morrison & Wells, 2000, 2007; Startup et al., 2007; Vorontsova et al., 2013) and four studies provided data demonstrating the difference in rumination scores between clinical and non-clinical groups (Badcock et al., 2011; Ricarte et al., 2014; Rowland et al., 2012; Vorontsova et al., 2013). Morrison and colleagues (2007) described mean scores for both social and health worry; the former was chosen for the current analysis as it is more widely cited in psychosis literature and has been shown to be important in the experience of key psychotic phenomena (Freeman, Gittins, et al., 2008). Vorontsova et al. (2013) reported on differences between two clinical groups in addition to controls, splitting those with psychosis and concurrent depression and those with psychosis alone. For the purpose of the current meta-analysis, the latter group was chosen as this was thought to offer a more 'pure' test of the comparison and more conservative estimates (especially given that depression itself is associated with rumination; Nolen-hoeksema & Morrow, 1993). The random-effects model for worry produced a large (Cohen, 1992) pooled standardised mean difference of .881 (95% CI .569-1.19) and identified moderate heterogeneity [$Q=14.84$ (6), $p=0.02$; $\tau^2=0.10$; $I^2=59.57$]. A plot of the results can be seen in Figure 2. The random effects model for rumination produced a large (Cohen, 1992) pooled standardised mean difference of .842 (95% CI .586-1.10), with low heterogeneity [$Q=1.75$ (3), $p=0.63$; $\tau^2=0.00$; $I^2=0$]. A plot of the results can be seen in Figure 3. Importantly, both meta-analyses produced confidence intervals that did not include zero, demonstrating that all the current evidence suggests that worry and rumination are higher in groups experiencing psychosis compared to those without. Formal tests of publication bias were not conducted given the limited number of small studies, associated limited statistical power to test effects and narrow range of study size (Egger, Smith, Schneider, & Minder, 1997; Sterne, Gavaghan, & Egger, 2000).

Figure 2: Worry meta-analysis results

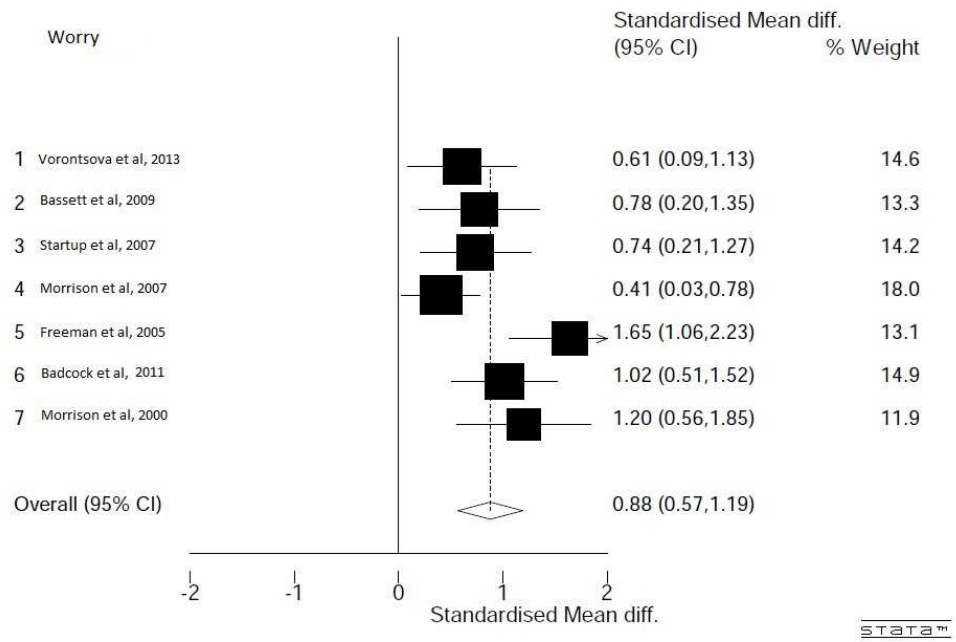


Figure 3: Rumination meta-analysis results

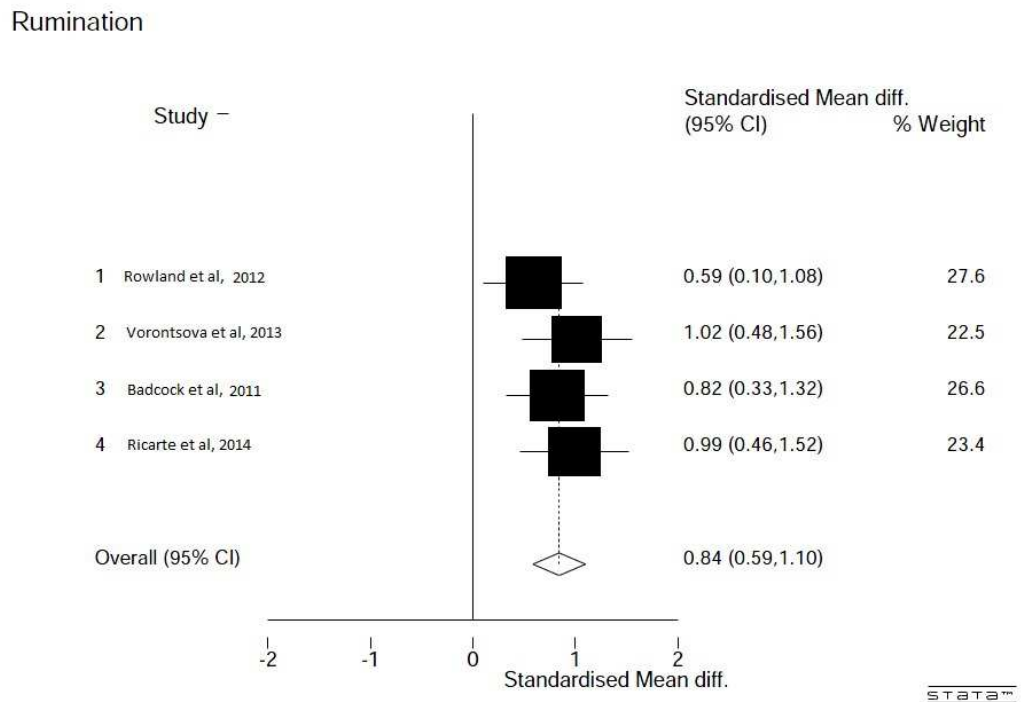


Table 1: Summary of main findings from the review

Paper	Sample	Relevant measures	Summary of main findings	Overall quality rating	Adapted quality rating
Badcock et al 2011	n= 34 people with Schizophrenia and current hallucinations; n= 34 non-clinical controls	PSYRATS, PSWQ, Ruminative Response Scale (RRS), Hospital Anxiety and Depression Scale (HADS)	Rumination correlated with hallucination distress but not severity. Partial correlation controlling for depression non-significant. Worry not significantly correlated with hallucination distress or severity.	2- Moderate	1- Strong
Bassett 2009	n= 25 people with a schizophrenia spectrum diagnosis and current persecutory delusions	PSWQ, PSYRATS Delusions	Worry significantly higher in clinical group. Worry significantly correlated with delusion preoccupation duration, distress amount but not preoccupation amount, conviction or distress intensity.	3- Weak	3- Weak
Bell 2011	n= 193 general population; n= 30 patients with non-affective psychosis and current persecutory delusions	CAPS, PSWQ	Worry significantly correlated with total score, distress, intrusiveness and frequency of anomalous perceptual experiences in both clinical and non-clinical population.	3- Weak	2- Moderate
Carse 2013	n= 152 psychology students and general population	Peters delusion inventory (PDI)- presence and distress, conviction, preoccupation, total; RRS	Rumination significantly associated with delusion proneness- distress, preoccupation and conviction, with the relationship independent of age.	3- Weak	2- Moderate
Flower 2015	n= 28 low paranoia, 28 high paranoia students	Paranoia Scale; Thought Control Questionnaire (TCQ) - Worry subscale	High paranoia group scored higher than low paranoia group on measure of worry as a thought control strategy.	3- Weak	3- Weak
Foster 2010	n= 21 people with schizophrenia, current persecutory delusion and clinically significant levels of worry	PSYRATS, Green Paranoid Thoughts Scale (GPTS), PSWQ	Change in worry correlated with change in persecutory thoughts over one month (post-treatment) and with paranoia distress, delusional distress and paranoia frequency over 2 months.	3- Weak	2- Moderate

Freeman 1999	n= 15 people with current persecutory beliefs and a schizophrenia spectrum diagnosis; n= 14 participants with GAD	Personal questionnaires, British Psychiatric Rating Scale (BPRS), PSWQ	Trait levels of worry not significantly related to current severity or distress of paranoia.	3- Weak	3- Weak
Freeman 2008	n= 200 general population, no history of severe mental illness	GPTS, PSWQ, CAPS, State Social Paranoia Scale (SSPS)	Trait worry significantly predicted levels of experimentally- induced paranoia.	3- Weak	2- Moderate
Freeman 2008	n= 200 non-clinical participants	PSWQ, SSPS	Worry did not distinguish between social anxiety and experimentally-induced paranoia	2- Moderate	1- Strong
Freeman 2010	n= 8580 general population participants as part of the 2000 British national psychiatric morbidity survey	Clinical Interview Scale- Revised (CIS-R), Psychosis Screening Questionnaire (PSQ)	Worry significantly associated with paranoia.	3- Weak	2- Moderate
Freeman 2010	n= 30 low nonclinical paranoia; n=30 high nonclinical paranoia; n= 30 with current persecutory delusions and a schizophrenia spectrum diagnosis	GPTS, PSWQ, SSPS	Trait worry distinguished between levels of paranoid thinking.	2- Moderate	1- Strong
Freeman 2011	n= 7281 participants with paranoia data from the 2007 British national psychiatric morbidity survey	PSQ, CIS-R	The presence of worry (two or above on four point scale) led to a significantly greater chance of each level of paranoia and almost nine times greater likelihood of highest level of paranoia.	3- Weak	2- Moderate
Freeman 2012	n= 8580 general population participants as part of the 2000 British national psychiatric morbidity survey	PSQ, CIS-R	Worry significantly predicts the inception and persistence of sub-clinical paranoia	2- Moderate	1- Strong
Freeman 2013	n= 67 people with current persecutory delusions, a schizophrenia spectrum diagnosis and clinically significant worry	PSYRATS, PANSS, GPTS, PSWQ, CAPS	Worry reduction led to fewer non-hallucinatory perceptual anomalies.	3- Weak	2- Moderate
Freeman 2015	n= 150 participant with a schizophrenia spectrum diagnosis, current persecutory delusion and a score of more than 44 on PSWQ	PSWQ, PSYRATS Delusions	CBT group improved on worry and dels. Each unit reduction in the worry factor produced a 0.27 change in the delusions factor (SE 0.06, 95% CI 0.15–0.39; p<0.001).- mediation analysis	1- Strong	1-Strong

Halari 2009	37 people with schizophrenia or schizoaffective disorder	PANSS, RSQ	Rumination not independently related to general levels of positive symptoms.	3- Weak	2- Moderate
Hartley 2014	n= 27 people with a schizophrenia spectrum diagnosis and currently experiencing auditory hallucinations and/or persecutory delusions	ESM Likert scales (scored 1-7) for paranoia and voice-hearing and associated distress	Worry and rumination in previous time period related to current persecutory delusion and auditory hallucination severity and distress.	3- Weak	3- Weak
Jones 2009	n= 296 students	Rumination and Reflection Questionnaire (RRQ), Launay-Slade Hallucination Scale-Revised (LSHS-R)	Rumination related to hallucination proneness via increases in suppression and intrusive thoughts.	3- Weak	2- Moderate
Martinelli 2013	n= 37 students	SSPS, PS, Perseverative Thought Questionnaire	Experimentally-induced paranoia was maintained by experimentally-induced rumination. Trait levels of perseverative thought also correlated with trait paranoia.	3- Weak	2- Moderate
Melo 2010	n= 600 UK and Portuguese students	Paranoia and Deservedness Scale (PDS), PTQ	Rumination significantly related to sub-clinical paranoia, independent of levels of depression.	3- Weak	2- Moderate
Morrison 2000	n= 22 people with a schizophrenia spectrum diagnosis; n= 22 non-patient control group	TCQ - worry subscale	Worry-based thought control strategies significantly more prevalent in clinical group.	3- Weak	2- Moderate
Morrison 2007	51 pts schizophrenia spectrum, n= 40 people with an anxiety disorder diagnosis; n= 60 students	Anxious Thoughts Inventory (ANTI), PANSS, PSYRATS	Social worry and health worry related to facets of delusional severity and distress and general positive symptoms, but not hallucinations. Worry subscale scores higher in patient groups but do not distinguish between them.	3- Weak	2- Moderate
Newman-Taylor 2009	n= 150 general population	TCQ, PS	Trait paranoia significantly correlated with worry but not a significant predictor of worry as a thought control strategy when depression and anxiety controlled for.	3- Weak	2- Moderate
Ricarte 2014	n= 31 people with a diagnosis of schizophrenia; n= 31 general population	RRS, PANSS Positive	Rumination distinguishes clinical and non-clinical groups but not related to general symptom severity	3- Weak	2- Moderate

Rowland 2013	n= 32 people with a schizophrenia spectrum diagnosis; n= 24 people with a bipolar disorder diagnosis; n=36 healthy controls	Cognitive Emotion Regulation Questionnaire (CERQ), PANSS	Rumination significantly higher in group with schizophrenia compared to healthy control group but not bipolar group.	2- Moderate	1- Strong
Startup 2007	n= 30 people with current persecutory beliefs; n=30 controls	PSYRATS, PSWQ	Group with persecutory beliefs scored higher on worry than general population sample. Worry was associated with the persistence of delusions.	3- Weak	2- Moderate
Vorontzova 2013	n= 60 people with persecutory delusions and a schizophrenia spectrum diagnosis (with depression and without); n=30 people with a diagnosis of depression; n= 30 non-clinical controls	PSYRATS, GPTS, PSWQ, RRS	Rumination and worry higher in group with persecutory delusions group, more so for those with concurrent depression. Worry related to the persistence of paranoid thoughts, rumination not.	3- Weak	2- Moderate

1.6 General discussion

1.6.1 Key findings and summary

We have summarised the findings of 27 papers that describe associations between worry and rumination, and positive psychotic symptoms. The literature has encompassed cross-sectional, longitudinal and experimental designs in addition to relatively novel methods (such as experience sampling methodology) and intervention trials, with a range of populations and sample sizes. A meta-analysis of group differences in worry and rumination confirmed that these constructs exist at elevated levels in groups experiencing psychosis, underlining the importance of investigating the specific links both theoretically and empirically; although, the possibility of publication bias cannot be ruled-out.

Evidence for the role of worry in the experience of delusions is overwhelmingly strong; incorporating the only randomised controlled trial in this review and thus the only paper assigned a strong rating by the quality assessment process. Although the role of pertinent confounding variables cannot be ruled out on the basis of the current evidence, worry has been shown to distinguish delusional groups from others, relate to numerous aspects of delusional experience, maintain delusional experiences over time and confer therapeutic effects when it is reduced. It should be noted that most of this work has focused on paranoia, which may limit its generalisability to other types of delusional experiences, but does fit well with a single-symptom approach hitherto recommended. In contrast, findings relevant for the role of worry in the experience of auditory hallucinations are limited and evidence countering this relationship is moderate in terms of quality as well as numerous. Although there is an indication that, in those currently experiencing symptoms, worry may affect the momentary experience of voice-hearing, this evidence is singular and not strong in quality. More generally, group comparison studies point to a potential drive for the prevalence of worry in psychosis, citing its role as a thought control strategy, a mechanism which might give credence to the links previously established.

Evidence for the role of rumination in the experience of psychosis is less prevalent, although remains convincing. Again, the review has uncovered a mix of clinical, non-clinical populations and a range of empirical approaches. There is a portion of work, including experimental studies, supporting a role for rumination in the presence, experience, maintenance and development of paranoia. As with worry, there are indications that other cognitive and affective processes (such as depression) may exert confounding influences, which warrant further exploration. Rumination has also been shown to be relevant in the experience of hallucinations; it distinguishes voice-hearing groups, contributes to the distress associated with voice hearing and significantly predicts momentary severity. There is also an indication of the mechanisms by which rumination might achieve this effect, incorporating a role for intrusive thoughts. In terms of the more general experience of psychosis, rumination does not seem to relate to general symptom levels, despite its associations with specific experiences.

1.6.2 Implications for psychological models and clinical intervention

The findings of this review offer further confirmation of the importance of affective processes in the experience of psychosis (Freeman & Garety, 2003; Hartley, Barrowclough, & Haddock, 2013), highlighting a role for negative perseverative thought processes in the severity and distress associated with a range of positive psychotic symptoms in both clinical and sub-clinical groups. This further undermines the idea of a diagnostic taxonomy that seeks to delineate these groups of experiences and supports current psychological models that hypothesise their integration and mutual influence (Garety, 2001; Morrison, 2001). Furthermore, in identifying two specific thought processes that seem to have meaningful associations with the experience of psychosis, the current review highlights the opportunity for therapeutic interventions to directly target these processes and in doing so, underline their causal influence while also contributing to evidence-based interventions for schizophrenia-spectrum difficulties, an approach which is already being explored (Freeman et al., 2015). Future therapeutic work might seek to employ strategies that target

beliefs around the utility of worry and rumination, or subsequent negative beliefs thereof (Wells & King, 2006; Wells & Papageorgiou, 2004), foster a more accepting approach to inner experiences that reduces the negative perseverative elements of worry and rumination (S. C. Hayes, Strosahl, & Wilson, 1999), or offer an alternative, flexible way to attend to thoughts (Baer, 2003). Transdiagnostic process approaches (Harvey et al., 2004) such as these might also offer an opportunity to reduce the stigma associated with psychosis, which continues to be prevalent (Pyle & Morrison, 2013; Wood, Birtel, Alsawy, Pyle, & Morrison, 2014), and which might be reduced if psychosis as a discrete condition is less in the spotlight and transdiagnostic processes are targeted in this intrapersonal context as they are targeted in other conditions.

1.6.3 Limitations of the review, current body of work and future directions

For pragmatic reasons, the current review was limited to papers presented in English language, which might have neglected some relevant material. Moreover, the selection of search terms, although theoretically driven and efficacious in delivering a large number of papers, is nevertheless limited.

As acknowledged above, the quality assessment tool utilised in the current review was chosen as it has been systematically validated and demonstrated good reliability and validity. However, the tool was not designed to appraise non-intervention studies and therefore its utility in this context is limited. The field would benefit from a well-validated tool that has been specifically developed to assess the quality of papers that incorporate mostly cross-sectional or observational analyses, which might offer more scope for comparison within this group, and avoid 'floor effects'.

The studies included in the current review have explored links between a range of experiences; paranoia, delusional ideas, auditory hallucinations, worry (as a perseverative thought process, a thought control strategy), rumination (as an emotional regulation strategy, a type of perseverative thought) and a number of confounding variables (including depression, anxiety, demographic factors). This being the first comprehensive review in the area (to

the authors' knowledge), the breadth of the literature included is a strength of the paper, offering an overview of the field as it stands. However, this also resulted in moderate levels of heterogeneity in the worry meta-analysis and constituted a barrier to more fine-grained quantitative synthesis. Future work might seek to hone in on particular avenues of investigations (such as the link between worry and paranoia) in order to provide a more homogenous sample, amenable to meta-analysis and firmer conclusions. The review has also highlighted the relative dearth of studies investigating the role of rumination in psychosis. Future work might seek to remedy this and in doing so, further highlight the relevance of this somewhat neglected area.

Despite there being a large body of evidence demonstrating significant associations between worry, rumination and the experiences of psychosis, little is elucidated about the mechanisms underlying these links. Some authors have evidenced links via thought suppression and intrusions (Jones & Fernyhough, 2009) and other papers have demonstrated that the relationships might be confounded by affective factors (Freeman, Pugh, et al., 2010; Vorontsova et al., 2013), highlighting another potential causal pathway. Future work should seek to explore potential mediators, including cognitive, affective, behavioural and even physiological aspects, utilising sophisticated methods incorporating experimental/ intervention designs or structural equation modelling to uncover causal pathways, while controlling for possible confounding factors. Furthermore, the idea that some psychotic experiences might be conceptualised as perseverative processes themselves warrants further exploration in the context of phenomenological research. It may be that paranoid thinking is an accumulation of worry/ rumination regarding interpersonal danger, while intrusions resulting from ruminations deliver thought disorder.

More generally, the field would benefit from the addition of studies utilising approaches that offer insight into the causal nature of these links. This might include therapeutic intervention trials and experimental manipulation with larger, definitive samples; only then will the evidence be at the quality level required to support substantial changes in the provision of clinical interventions for people experiencing psychosis.

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2. Rumination and psychosis: an experimental, analogue study of the role of perseverative thought processes in voice-hearing

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2.1 Highlights

- Investigated the role of rumination in voice-hearing using an analogue sample
- Students watched a stressful film and then were randomised to ruminate or distract
- Groups did not differ on their experiences in response to a voice-hearing task
- Rumination may not be involved in the development of voice-hearing experiences

2.2 Abstract

Objectives: Previous work has demonstrated that rumination is associated with aspects of psychosis, including delusional beliefs and voice-hearing. The current study aimed to build on this to rigorously test the role of rumination in the development of voice-hearing type experiences.

Methods: An analogue sample of 102 students completed baseline measurements of trait rumination, metacognitive beliefs and proneness to auditory hallucinations. Participants watched a video clip depicting a physical assault and then were randomised to either ruminate about the contents of the clip or distract themselves with a series of general knowledge questions. Following this, participants were presented with an anomalous auditory stimulus and asked to record any words or phrases along with associated distress. Groups were compared on number of words recorded, convergence with the video content and average distress levels; participants also completed state measures of paranoia.

Results: Manipulation checks confirmed that the rumination group showed greater perseveration regarding the film content than the distraction group. However, the groups did not significantly differ on any of the outcome measures.

Limitations: The study did not explore the numerous aspects of voice-hearing experiences such as beliefs in power and origin. There might also be more effective alternatives to the distraction task as a comparator condition.

Conclusions: These findings indicate that, despite a possible role in the maintenance of voice-hearing, distress and paranoia, rumination might not necessarily be involved in the development of these experiences or the associated distress.

Keywords: psychosis; rumination; voice; auditory hallucination; schizophrenia; trauma

2.3 Introduction

2.3.1 Overview of the literature and study rationale

Rumination is a type of perseverative processing, defined as ‘a class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts’ (Martin et al., 1996, p. 7). Rumination has traditionally been associated with depression, with a wealth of evidence to suggest that it can maintain and augment depressed mood (e.g. Nolen-hoeksema & Morrow, 1993). More generally, several negative consequences of rumination have been identified, including increased negative interpretations of events (Lyubomirsky & Nolen-Hoeksema, 1995), over-generalised negative memories (Park et al., 2004), attentional bias towards negative material (Donaldson, Lam, & Mathews, 2007), greater levels of cognitive and behavioural avoidance (Cribb et al., 2006), and increased levels of intrusions (Lyubomirsky et al., 2003; Watkins, 2004). These secondary consequences converge with key themes in the aetiology and maintenance of experiences associated with psychosis, including the importance of intrusions, attentional biases, avoidance, perseverative processing and contextualised memories (Garety, 2001; Morrison, 2001; Waters, Badcock, Michie, & Maybery, 2006).

More recently, research has demonstrated high levels of rumination in groups experiencing psychosis (Badcock et al., 2011; Rowland et al., 2012; Vorontsova et al., 2013) and has pointed to a role for rumination in delusional ideas (Carse & Langdon, 2013; Martinelli et al., 2013; Melo & Bentall, 2010) and voice-hearing (Badcock et al., 2011; Jones & Fernyhough, 2009). Structural equation modelling in a student sample study has demonstrated that rumination is linked with voice-hearing proneness via increases in thought suppression and intrusive thoughts (Jones & Fernyhough, 2009).

Alongside this body of work, there is a large evidence base supporting a role for trauma in the experience of psychosis (Bentall, Wickham, Shevlin, & Varese, 2012; Varese et al., 2012). Ruminative processing has also been cited as a maintaining factor for post-traumatic stress disorder (PTSD) symptoms

(Ehlers & Clark, 2000; Ehling, Frank, & Ehlers, 2008), owing to its contribution to cognitive avoidance, uninhibited intrusions and strengthened negative appraisals. Given the understanding that voices often share content with past traumas (Hardy et al., 2005) and the suggestion that ruminative thoughts concerning the events of past traumas might be falsely interpreted as voices (Fowler et al., 2006), there is an opportunity to combine these lines of inquiry to provide theoretically-sound, robust evidence for the role of rumination in voice-hearing. The aim of the current study therefore, is to explore whether, following distressing material, ruminative processing leads to increased hallucination-like experiences, given the provision of anomalous auditory material (Feelgood & Rantzen, 1994). It is argued that the contents of the stressful material, when subject to ruminative processing, will give rise to more cognitive intrusions which, in the context of anomalous auditory material (and especially in light of key metacognitive beliefs about intrusions), will augment the experience of voice-hearing phenomena. The 'trauma film' paradigm is widespread in the empirical PTSD literature and been shown to provide a useful experimental tool for prospectively investigating the consequences of different post-trauma reactions or processing strategies (Holmes & Bourne, 2008). Previous evidence has already indicated that levels of rumination in response to stressful material are linked to more intrusive memories (Laposa & Rector, 2012; Zetsche, Ehling, & Ehlers, 2009), but it has not yet been discerned whether this extends to voice-hearing type experiences. Furthermore, there is the opportunity to explore whether this relationship is moderated by pre-existing beliefs about intrusions that are a key part of cognitive models of psychosis (Morrison, 2001), and have already been shown to be related to voice-hearing experiences and psychosis (Lobban, Haddock, Kinderman, & Wells, 2002; Morrison, French, & Wells, 2007; Morrison & Wells, 2003). That is, if people experience increased intrusions and also believe these to be dangerous or uncontrollable, voice-hearing and associated distress will be even more likely.

If ruminative processing is related to post-stress intrusions and psychosis-like experiences, potential clinical implications include fostering

more adaptive processing styles, especially in those with experience of trauma. These might involve detached mindfulness (Wells, 2005), mindfulness Acceptance and Commitment Therapy (ACT)-based approaches (S. C. Hayes et al., 1999) or modifying beliefs around the perceived utility of rumination (Papageorgiou & Wells, 2004) in conjunction with trauma-based interventions (Larkin & Morrison, 2007), where appropriate.

2.3.2 Aims and Hypotheses

The current study is the most stringent test yet of a role for rumination in the development of voice-hearing type experiences, emerging from a cross-sectional evidence base to test predictions experimentally. Our principal aim was to investigate whether experimentally-induced rumination following exposure to stressful video material would be related to hallucination-like experiences and the distress associated with these. It was hypothesised that adopting a ruminative processing strategy (as compared to distraction) would result in a greater number of words or phrases reported in the voice-hearing task. It was also predicted that this relationship would be moderated by levels of metacognitive beliefs about the uncontrollability and danger of intrusions and the need to control thoughts, such that higher scores strengthen the relationship, building on previously findings. In addition, we hypothesised that the average level of recorded distress in the auditory tasks, the number of thematic matches with the film content and overall number of recordings would be higher for the rumination group. Finally, as has been implied by previous work (Martinelli et al., 2013), we predicted that rumination would result in greater state paranoia.

2.4 Method³

2.4.1 Design

The current study employed a group comparison design, with levels of the post-manipulation scores on the auditory task and other measures compared between groups (rumination vs. distraction). During planning stages, the project was presented to a group of service users, clinicians and academics who were part of the Psychosis Research Unit (<http://www.psychosisresearch.com/>) to garner public and patient views on the rationale, aims and methodology, with appropriate adaptations subsequently made (see appendix 3 for the presentation). The final design was approved by the Clinical Psychology Doctorate Research Subcommittee and received input from the Community Liaison Group, which includes current and ex-service users. The design allowed for the inclusion of moderators (metacognitive beliefs) and confounding variables (e.g. gender, trait levels of rumination) in multivariate analyses.

2.4.2 Participants

The novel nature of the current study renders direct comparison with previous effect sizes inappropriate. Given a simple group mean comparison and estimating a medium (~0.56) effect size based on previous analogue studies that have investigated a role for rumination in voice-hearing (Jones & Fernyhough, 2009), a sample of 51 participants in each group (102 total) would have above 80% power to detect an effect with alpha level of 0.05. Recruitment of an analogue sample of university students and university staff was conducted in an opportunistic fashion utilising poster advertising (see appendix 4) and the university participation credit scheme. Participants were provided with a detailed information sheet (see appendix 5) and given at least 24 hours to consider this. Inclusion criteria were assessed by a self-report screening tool (appendix 6) and comprised the following: English-speaking, 18 years old or above, normal/ corrected vision and hearing. Potential participants were excluded if they had: a history of or current contact with secondary care

³ Detailed reflections on the study design and procedure are included in paper three, section 3.4

psychiatric services, experience of physical assault (as this may increase the likelihood of the video clip inducing very high levels of distress; assessed using the Trauma History Screen; Carlson et al., 2011) or viewed the video footage previously (as this may have confounded the findings). Potential participants were provided with the study information sheet via email or as a hard copy and given at least 24 hours to consider this prior to screening and written consent (see appendix 7 for the consent form) being provided. Recruitment materials explicitly stated the inclusion of stressful video material and all participants were telephoned within 24 hours following the tasks to check for residual distress; none reported this.

2.4.3 Measures and materials

The full measures pack can be seen in appendix 8.

Trait rumination: The Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991), excluding depressive symptom items (see Treynor et al., 2003), was used to assess baseline tendencies to ruminate as it was predicted that this might confound the effect of the manipulation. The 10 items are scored on a four-point Likert scale (almost never; sometimes; often; almost always) and include items such as “Think about a recent situation, wishing it had gone better” in relation to typical responses to low mood. The scale has shown good internal consistency and convergent validity (Nolen-Hoeksema & Morrow, 1991) and the factor structure of the modified version has been confirmed (Treynor et al., 2003). The alpha level in the current study ($\alpha = .780$) demonstrated good internal consistency.

Hallucination proneness: Participants’ tendency to experience perceptual anomalies was assessed using the Launay-Slade Hallucination Scale (LSHS; Bentall & Slade, 1985). The LSHS consists of 12 items, such as “I often hear a voice speaking my thoughts aloud”, which are scored on a five-point Likert scale from 0 (certainly does not apply to me) to 4 (certainly applies to me). The scale

has shown good test-retest reliability previously (Bentall & Slade, 1985), with good internal consistency demonstrated in the current study ($\alpha = .806$).

Metacognitive beliefs: Beliefs about the uncontrollability and danger of intrusions and the need to control thoughts were assessed using the second (16 item) and fourth (13 item) subscale of the Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997), respectively. The items are scored on a four-point Likert scale from 1 (do not agree) to 4 (agree very much). The scale has previously shown good reliability and validity (Cartwright-Hatton & Wells, 1997) and the subscales demonstrated excellent (α subscale 2 = .921) and good (α subscale 4 = .831) internal consistency in the current study.

Video material⁴: The material upon which half the participants were subsequently asked to ruminate consisted of the presentation of a 4 min 33 second clip from 'The Brave One'; an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple. This was chosen as it was thought to have high ecological validity and fits with the interpersonal nature of trauma that people with psychosis have often experienced (Bentall et al., 2012; Varese et al., 2012), as opposed to the 'accidental' vehicular or industrial incidents often utilised in PTSD literature (Weidmann, Conradi, Gröger, Fehm, & Fydrich, 2009).

Manipulation: The manipulation was developed from previous similar work documented in the trauma research field, which has utilised verbal prompts to encourage rumination or distraction (Zetsche et al., 2009). Participants in the rumination condition were presented with a series of 12 prompts to stimulate ruminative thought regarding the film clip, including: "What if I was attacked like the couple were?"; "Why do people have to be so violent?"; "How would I cope if that happened to me?". Prior to inclusion the prompts were scrutinised by a group of 13 Clinical Psychology Doctorate trainees to validate their relevance for trauma experiences. The distraction group was presented with a

⁴ The video clip and the process by which this was selected is outlined in paper three, section 3.4.5.3

series of six general knowledge tasks, including “List 10 elements from the periodic table”. Each task lasted for 12 minutes.

Manipulation check: The success of the manipulation procedure (rumination vs. distraction) was assessed using the Perseverative Thought Questionnaire (PTQ; Ehrling, 2007; Ehrling et al., 2011), which has been used in previous similar studies within the PTSD experimental literature, adapted to target state rumination (Ehrling, Szeimies, & Schaffrick, 2009). The scale consists of 13 items scored on a five-point Likert scale (0 never – 4 almost always) preceded by the following instruction: “In this questionnaire, you will be asked to describe how you thought about the video clip in the past 12 minutes. Please read the following statements and rate the extent to which they applied to you while you were thinking about the contents of the video clip”. The tool has shown good reliability and validity previously (Ehrling, 2007) and demonstrated excellent internal consistency in the current study ($\alpha = .921$).

Voice-hearing⁵: The stimulus used to emulate voice-hearing experiences reflected that described in the original study that used the task (Feelgood & Rantzen, 1994), which consisted of the presentation of a clip of a human voice recording, which had been spliced into 1 second clips, randomised and played backwards. Participants were instructed as follows: “I want you to listen closely to a recording. There are words or phrases in this recording. Try to detect these words and phrases, and when you hear them, write them down below and indicate (by ticking the appropriate box) how distressing you found the experience.” Measures taken from the auditory task included: number of recordings, number of eligible words or phrases (comprising more than one syllable; Feelgood & Rantzen, 1994), number of thematic matches with the video content (see below for analysis method), average distress experienced (each recording rated on a scale of ‘1- Not distressing at all’ to ‘7- Very distressing’). These measures were used as they provided a method to assess the frequency of voice-hearing experiences, the distress they elicited and the convergence with the film content; if rumination does have a role in the

⁵ The nature of the voice hearing paradigm and its limitations are explored in section 3.4.5.5 of paper 3

development of voices after stressful material, via increased intrusions, one would expect that the rumination group experiences more words or phrases, were more distressed by these and were more likely to match the film content on which the rumination was focussed.

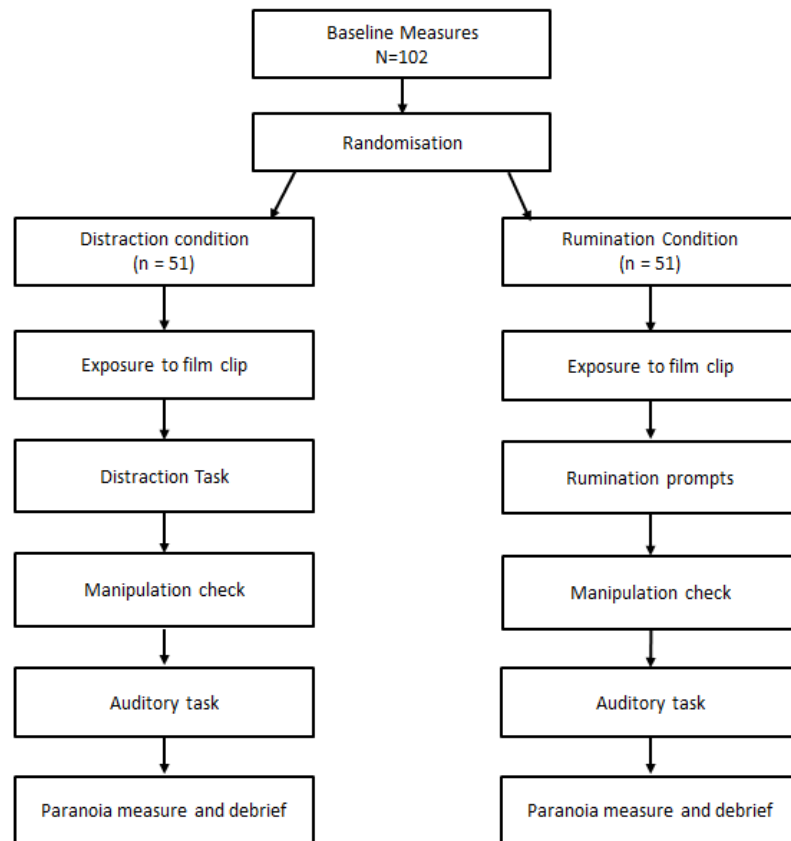
Stata paranoia: Levels of paranoia following the manipulation and auditory task were assessed using the State-adapted paranoia checklist (Freeman et al., 2005; Westermann, Kesting, & Lincoln, 2012), which consists of 54 items split into three subscales: Frequency, Belief and Distress, applied to items such as “I need to be on my guard against others’ and rated on a five-point (1-5) Likert scale. The measure has shown good internal consistency and convergent validity previously (Freeman et al., 2005) and demonstrated good-excellent internal consistency in the current study ($\alpha = .886; .914; .908$ for the frequency, belief and distress subscale, respectively).

2.4.4 Procedure

A full description of the study procedure is depicted in Figure 4. Randomisation was conducted by an independent statistician, although the principal researcher was not blind to study group when allocating. Participants were randomised using a computer-generated block design with random-sized blocks varying from two to eight subjects; stratification was not used due to inherent difficulties in estimating baseline characteristics with rolling recruitment methods (Suresh, 2011). The study was conducted in University experimental testing cubicles. Participants utilised Panasonic RPHT225 over the ear Extra Bass Monitor Headphones and material was displayed on a desktop computer (Dell Optiplex 7.45 Series operating Windows 7 and with Dell E171FP display with screen resolution set to 1280x1024). Presentation of the audio-visual materials and instructions was standardised using Microsoft PowerPoint (see appendices 9 and 10). In order to mitigate distress, participant information sheets included signposting to local services, University Student Services, NHS 111 and the Samaritans. The researcher checked distress at the end of the experimental session and a follow-up phone call was made within 24 hours; no participants reported distress at this time. Participants were also provided with normalising information (French et al., 2011) around psychosis-like

experiences following the final task. Where trauma (any type included within the screening tool) was disclosed as part of screening procedures, participants were signposted to their GP to access services if they wished.

Figure 4: Study procedure



2.4.5 Data analysis

IBM SPSS (Version 22) was used for all quantitative analyses. An independent volunteer checked a random selection of 20% of the data against hard copies prior to any analysis; the remainder was checked by examining the minimum and maximum values and distribution for appropriateness, given each scale's parameters. Missing data were pro-rated with the mean for that scale where less than 10% of the scale data were missing. Where this limit was exceeded, the participant was excluded from the selected analyses involving that scale.

The distribution of the data was assessed using a range of tools: skewness and kurtosis z scores, histogram, PP and QQ plots and outlier analysis. Where distribution fell outside acceptable ranges for the assumption of normality, appropriate transformations were attempted. Preliminary analyses included checking the success of the manipulation procedure (that the rumination group scored higher on state measure of perseverative thought than the distraction group), ascertaining whether any difference between groups existed at baseline and assessing differences in key outcome variables (number of words, recordings, matches and average distress from the auditory task, and paranoia subscales) between the two conditions using independent samples t-tests or non-parametric equivalents, where appropriate. Multivariate analysis was planned to include outcome measures deemed significant at the univariate stage and any confounding variables identified as significant differences between groups at baseline, combined in a hierarchical multiple regression, with moderation of significant relationships assessed using interaction terms including MCQ factor scores.

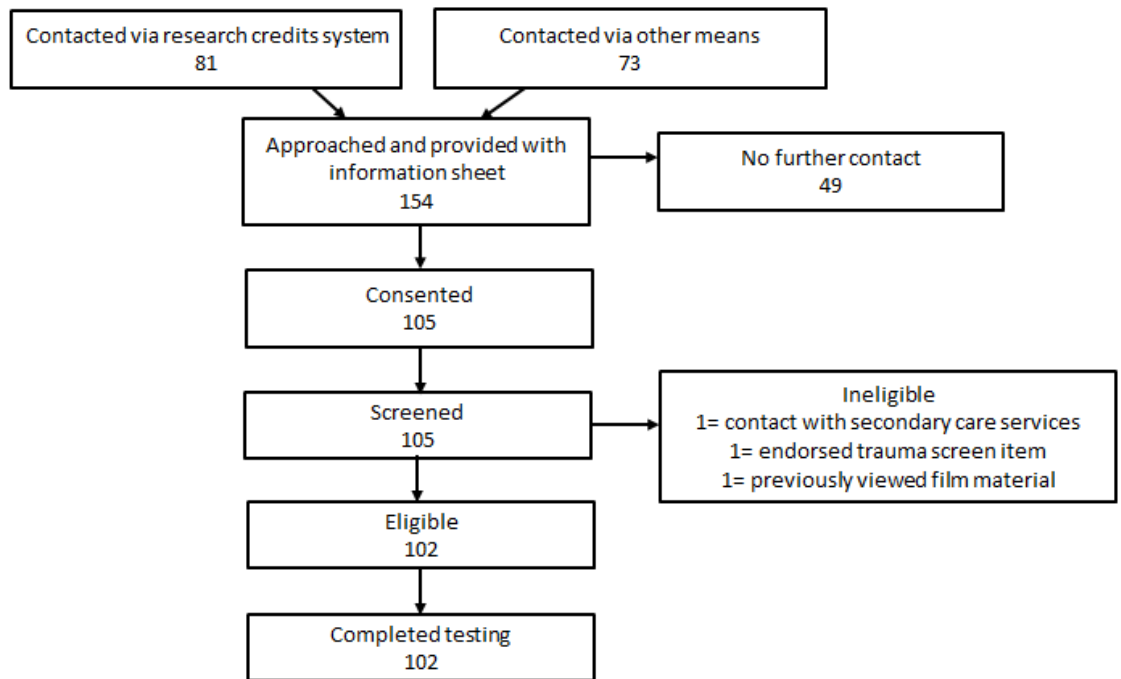
Prior to study initiation, the first author obtained a verbatim script of the film clip and applied content analysis to assign a list of codes. These were iteratively applied and the codes grouped into thematic categories based on procedures previously outlined for content-coding (Krippendorff, 1984), resulting in 18 possible codes (appendix 11). Lines of the script could attract more than one code; the full coding frame and instructions are available from the first author. Participants' written recordings from the auditory tasks were collated and coded for eligibility (comprising more than one syllable; Feelgood & Rantzen, 1994) by the first author, who also averaged distress scores. An independent researcher blind to randomisation condition coded the recordings as matching one or more of the film-themed codes (or not). A randomly-selected sample of the recordings was second-rated by another independent researcher to assess for inter-rater reliability, which was calculated at 81% agreement and a kappa value of .495 ('moderate'; Landis & Koch, 1977). A specialised reliability statistic was also applied to suit this content-coding data (KALPHA; A. F. Hayes & Krippendorff, 2007), which estimated an alpha of .486.

2.5 Results

2.5.1 Sample characteristics and randomisation

One hundred and two participants were recruited to the study with the randomisation procedure allocating 51 to each condition, as planned. The flow through the stages of recruitment can be seen in Figure 5. The mean age of the sample was 21 years old (SD 4.12), comprised 78 females and 24 males, with the majority (n=87, 85%) currently engaged in a psychology-related area of study. Additional demographic characteristics can be seen in Table 2. Distribution checks revealed that data from the Paranoia Checklist subscales and auditory task measures (number of recordings, words, matches and average distress) were positively skewed. This was remedied by the use of logarithmic transformations, with the transformed scores used in all subsequent analyses. Age at testing was also positively skewed but could not be successfully transformed; therefore, non-parametric tests were used. Means (or medians, where appropriate) and standard deviations (or ranges, where appropriate) of key variables can be seen in Table 3. Chi-squared, independent samples t-tests, and Mann-Whitney U tests (as appropriate) indicated no significant differences in demographic or baseline measures (LSHS, RRS, MCQ) between the conditions. The manipulation was successful, generating higher mean levels of perseverative thought in the rumination condition (17.14, SD 7.60) as compared to the distraction condition (14.00, SD 7.90), with significance confirmed by an independent sample t-test [$t(100) = -2.04, p = .044$].

Figure 5: Participant recruitment



Independent samples t-tests comparing the rumination and distraction conditions demonstrated that there were no significant differences in the primary outcome of number of eligible words recorded as part of the auditory task [$t(100)=.400$, $p=.690$]. There were also no significant differences in the number of overall recordings [$t(100)=.502$, $p=.616$], thematic matches [$t(100)=.557$, $p=.579$], average distress [$t(100)=-.724$, $p=.471$] or level of paranoia frequency [$t(100)=-.081$, $p=.935$, belief [$t(99)=-.187$, $p=.852$] or distress [$t(100)=.266$, $p=.791$]. In preparation for covariate inclusion, bivariate correlations were conducted and showed that there were no significant correlations between baseline levels of metacognitive beliefs (regarding need to control thoughts or uncontrollability and danger) or trait rumination and the voice-hearing outcome variables (see Table 4). However, there were significant associations with the paranoia subscales (see Table 4). Given the lack of significant findings regarding the a priori hypotheses at this stage, multivariate analyses were not conducted⁶. In order to confirm that the voice-hearing task operated in the manner expected and previously demonstrated (Feelgood &

⁶ The planned multivariate analysis strategy is detailed in section 3.4.7 of the reflective paper

Rantzen, 1994), the association between the number of recordings and proneness to hallucinate was checked, which showed that the tasks did indeed tap into similar phenomena as outlined in the original study [$r(99)=.250$; $p=.013$], in addition to similar average levels of recordings (see Table 3).

Table 2: Characteristics of the sample

		n (%)
Ethnicity	White British	67 (65.7)
	White European	10 (9.8)
	Chinese	10 (9.8)
	Mixed Race	5 (4.9)
	British Asian	3 (2.9)
	Pakistani	3 (2.9)
	Caribbean	2 (2.0)
	Arab	1 (1.0)
	Other Asian	1 (1.0)
Living status	Private accommodation	53 (52)
	Student accommodation	49 (48)
Country of origin	United Kingdom (UK)	77 (75.5)
	Non-UK	25 (24.5)
Native language	English	82 (80.4)
	Non-English	20 (19.6)
Highest education level achieved	Below degree level	92 (90.2)
	Degree level	9 (8.8)
	Above degree level	1 (1.0)

Table 3: Distributions of key variables

		Whole Sample			Rumination Group			Distraction Group		
		Mean/Median	SD/Range	N	Mean/Median	SD/Range	N	Mean/Median	SD/Range	N
Baseline	Rumination Scale (RRS)	20.32	5.13	102	20.41	5.10	51	20.24	5.21	51
	Launay-Slade Hallucination Scale (LSHS)	13.15	7.59	99	12.88	7.56	48	13.41	7.68	51
	Metacognitions Questionnaire (MCQ) Factor 2	32.65	9.85	99	32.92	10.75	49	32.38	8.98	50
	Metacognitions Questionnaire (MCQ) Factor 4	23.37	6.46	99	23.63	6.61	49	23.12	6.37	50
Manipulation	Perseverative Thought Questionnaire (PTQ)	15.57	7.87	102	17.14	7.60	51	14.00	7.90	51
Auditory task	Number of recordings*	6.50	30.00	102	6.00	18.00	51	7.00	30.00	51
	Number of eligible words or phrases*	4.00	22.00	102	4.00	15.00	51	4.00	22.00	51
	Number of thematic matches*	1.00	8.00	102	1.00	4.00	51	1.00	5.00	51
	Average distress*	2.00	7.00	102	2.00	7.00	51	2.00	6.58	51
State paranoia	Paranoia: Frequency*	30.00	43.00	102	30.00	43.00	51	29.00	42.00	51
	Paranoia: Belief*	30.00	61.00	101	30.00	61.00	51	29.00	58.00	50
	Paranoia: Distress*	30.00	56.00	102	31.00	48.00	51	29.00	56.00	51

* Medians and range reported as non-normally distributed. Note: MCQ Factor2: uncontrollability and danger of intrusions, MCQ Factor 4: need to control thoughts

Table 4: Pearson's r correlations between baseline measures and outcome variables

	Number of recordings	Number of eligible words or phrases	Number of thematic matches	Average distress	Paranoia: Frequency	Paranoia: Belief	Paranoia: Distress
Rumination Scale (RRS)	.125	.136	.119	.125	.506*	.381*	.541*
Metacognitions Questionnaire (MCQ) Factor 2	.086	.120	.049	.110	.534*	.469*	.511*
Metacognitions Questionnaire (MCQ) Factor 4	.179	.177	.161	.057	.506*	.455*	.516*

* Significant at $p \leq .001$

2.6 Discussion

2.6.1 Summary of findings and general discussion

The current study experimentally manipulated cognitive processing strategies following provision of stressful film material with an interpersonal traumatic content. The manipulation was shown to be successful, with the rumination group engaging in more perseverative processing of the film content compared to the group encouraged to distract themselves. The voice-hearing paradigm was also functional, with outcomes corresponding to hallucination proneness, as has previously been demonstrated (Feelgood & Rantzen, 1994). However, despite predictions, analyses demonstrated that increased ruminative processing did not result in increased levels of voice-hearing experiences, distress or thematic convergence between experiences and the film content. This is the first study to explore experimentally these links between voice-hearing and rumination, and the first ever (to the authors' knowledge) to explore convergence in thematic content. As such, these non-significant findings are an important contribution to the hitherto cross-sectional literature. Our findings diverge from previous studies that have demonstrated a link between voice-hearing and rumination (Badcock et al., 2011; Jones & Fernyhough, 2009); however, this may be a result of the more robust experimental design in the current study. The lack of significant differences may imply that rumination is engaged in as a reaction to psychotic phenomena, which subsequently exacerbates their severity and distress-inducing qualities, rather than being an active force in their initial development.

The current study also did not support a significant role for rumination in the development of paranoia, which diverges from earlier work (Martinelli et al., 2013); although, this previous study specifically examined a maintaining role, and therefore the current findings may again suggest that rumination is associated with the maintenance of persecutory ideas, rather than their initial development.

Despite being a subsidiary hypothesis (and not followed to the later stages), initial analyses also demonstrated that baseline trait levels of

rumination and metacognitive beliefs did correlate with state paranoia, which corroborates previous findings (Melo & Bentall, 2010; Varese, Barkus, & Bentall, 2011), although not with experimentally-induced hallucination-like experiences or distress, which is a novel finding of the current study.

2.6.2 Limitations

The current study has a number of important strengths, including adequate statistical power, the rigorous experimental controls, randomised allocation to condition and blind-coding of content data. However, there are also a number of limitations to the current work which should be considered prior to firm conclusions being drawn.

It could be argued that, despite its prolific use in previous literature (such as Ehring et al., 2009; Zetsche et al., 2009), distraction might not be the most divergent comparator for ruminative processing, as it might inadvertently encourage suppression in some cases, which could also backfire and increase intrusions (Wegner et al., 1987). An alternative might be to engage in mindfulness meditation or a specific mindful awareness of intrusions, which can be successfully induced in short time periods (Broderick, 2005; Wahl, Huelle, Zurowski, & Kordon, 2013). The current study aimed to replicate previous paradigms as much as possible, as considerable novel aspects were already warranted to explore new hypotheses regarding voice-hearing and additional randomisation arms would have required a prohibitive number of participants, although future work might wish to explore multiple comparison groups.

The voice-hearing paradigm used in the current study has been established as valid (Feelgood & Rantzen, 1994), and the levels of recordings in the current study mirrored those for the 'high scoring' group in the original paper. Nevertheless, the number of recordings and average levels of distress are relatively small, which could have hampered the search for significant findings. Future work might seek to utilise 'high-risk' samples, although this might also present greater ethical issues. Alternative voice-hearing paradigms are also in development (Huque, Poliakoff, & Brown, 2014), utilising more ominous stimuli

that might be more likely to induce distressing experiences and thus permit greater exploration of their predictors.

There are also a number of key factors not assessed (and therefore not explored or controlled for) in the current study, such as source monitoring (Keefe, Arnold, & Bayen, 1999), general levels of distress and detailed trauma history, which might have both differed unexpectedly between groups prior to the experimental procedures, or may have been altered by the procedure in ways that foreshadowed any group differences. Moreover, the assessment of voice-hearing experiences, although varied, did not capture the wide range of responses to voices, such as beliefs about their power, control or origin (Chadwick, Lees, & Birchwood, 2000) or the subjective experience and phenomenology of voice-hearing (P. Thomas, Bracken, & Leudar, 2004), which might be an additional topic of investigation.

Finally, the relatively low content analysis inter-rater reliability, although moderate in classification, warrants caution when interpreting these findings, despite very clear indication of non-significance.

2.6.3 Implications for theoretical understanding, clinical interventions and future work

The current study, as outlined above, indicates that rumination might not be directly involved in the development of voice-hearing experiences and associated distress following stressful experiences. Therefore, it is unlikely that targeting rumination post-trauma could prevent the development of voice-hearing type experiences. However, this does not negate a role for rumination in the maintenance of these phenomena. Future work should seek to explore this more fully experimentally and consider piloting interventions that target rumination in those currently hearing voices. If this demonstrates that changes in rumination can be achieved, and are associated with changes in voice-hearing experiences, this opens the door for adaptations to current therapeutic strategies that incorporate targeted psychoeducation, modification of metacognitive beliefs or alternative approaches to cognitive processing. If future work adds to the weight of negative findings then clinical interventions

should continue to focus on thought processes that have well-evidenced roles (theoretically, experimentally and therapeutically), as has been demonstrated with worry (Freeman et al., 2015).

2.7 Conclusions

In summary, the current study has successfully manipulated perseverative processing following viewing of stressful film material and experimentally tested its impact on voice-hearing type experiences and associated distress. The findings indicate that rumination does not result in more hallucination-like experiences or distress, suggesting that ruminative processing might not be involved in the initial development of these experiences. However, this does not rule out a role for rumination in the maintenance of auditory hallucinations and the distress they elicit, which future work should continue to explore using rigorous methods that can legitimately explore causal influence.

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Declaration of interest

None.

3. Reflective Paper

3.1 Overview of the papers

The aim of the current body of work has been to investigate the role of negative perseverative processing in psychosis. The specific aims were twofold; to provide an up-to-date overview of the evidence for the role of worry and rumination in positive psychotic symptomatology, and to experimentally test the link between rumination and voice-hearing experiences. In order to achieve this, a systematic review of the literature was undertaken; collating, synthesising and critically evaluating the current literature relating to the associations between worry and rumination, and psychosis. This produced 27 papers, the findings of which indicated a broad evidence base supporting a role for both worry and rumination in positive symptoms. A simple group-difference meta-analysis confirmed the importance of this line of enquiry, demonstrating that worry and rumination are higher in groups experiencing psychosis. Studies comprised a range of designs, populations and targets of investigation, offering insight into links with delusions, hallucinations and positive symptomatology more generally. The strongest evidence emerged for the links between worry and paranoia, with more and higher quality papers; although, support was also shown for links with rumination. Evaluating the field as a whole, a number of limitations were identified, including the preponderance of cross-sectional designs thus limiting inferences of causality, and a relative dearth of research concerning rumination, despite similar theoretical drivers for its relevance. This provided a strong rationale for the second paper in the current thesis, with an aim to counter the largely cross-sectional body of work with a rigorous experimental test of the role of rumination in voice-hearing. Based on a continuum account of psychosis, previous evidence of feasibility and pragmatic practicalities, a student sample was recruited. The experimental design explored whether rumination following stressful material resulted in a greater degree of auditory-hallucination type experiences, given anomalous perceptual information. Randomly allocated to conditions, participants were instructed to either ruminate on the contents of a film depicting interpersonal violence, or distract themselves. The manipulation was successful with the former group

exhibiting more perseverative thought. However, this was not accompanied by a significantly greater number of hallucination-type experiences, or level of distress. In the context of previous evidence, the work presented here seems to suggest that rumination might be more pertinently involved in the maintenance of distressing psychotic experiences, rather than their initial development. This is an important novel finding, which will guide future research efforts and provide target tailored intervention efforts appropriately.

3.2 The continuum of psychosis and single symptom approaches

As outlined in paper one, the current body of work has employed a single symptom approach to study that acknowledges that psychosis is not a discrete phenomenon that occurs only in the context of diagnostic boundaries. Targeting single symptoms rather than diagnostic categories enables more acuity in the theoretical justifications and hypothesis testing, recognizing that findings may differ for delusions and hallucinations, for example. This mirrors the directions of therapeutic intervention, which are increasingly focused on distinct types of experiences (Freeman & Garety, 2006; Trower et al., 2004), rather than treating schizophrenia as a 'condition'. In the review paper, this approach was adopted via the use of targeted search terms and separate synthesis by symptom. This was fruitful as it enabled the differences in the quality and nature of the evidence for each symptom type to be delineated, and conclusions made in light of these differences. The aim of the experimental paper was clearly allied to a single symptom approach; investigating links with voice-hearing phenomena specifically and producing results reflecting this specificity. This enables clear distinctions to be made regarding the role of cognitive processes in different types of experiences, allowing intervention strategies to be targeted accordingly.

An additional aspect of both papers has been the acknowledgement that psychotic experiences exist on a continuum, with a small minority of the population experiencing diagnostic-levels, and a much larger group reporting those of sub-clinical severity (see Verdoux & van Os, 2002 for a review). This enables psychotic phenomena to be studied in those not reaching diagnostic thresholds and also reduces the theoretical and empirical ostracisation of

individuals reporting unusual experiences. This approach was employed via the inclusion of sub-clinical sample studies in the review paper and the use of a student population for the experimental study, which also enabled the exploration of the development of psychotic-like experiences in 'psychiatric-naïve' individuals.

3.3 Systematic Review paper

3.3.1 Rationale and review process

Paper one reports a systematic review of the literature in relation to links between worry and rumination, and positive psychotic symptoms. The search was thorough, producing 2596 papers once duplicates were removed. Despite this, there were inherent limitations introduced by the search methods. Although theoretically driven and efficacious, the search terms were not universally inclusive; the numerable types of delusion experiences descriptors (such as 'grandiose', 'reference', 'religious') were not included, for example. It was predicted this would produce a large number of irrelevant papers without much gain (if any) in those that could be included. Unwitting exclusion of relevant papers was also safeguarded against by contacting key authors in the field and reviewing the reference lists of the included papers. An additional issue is the use of English language as an inclusion criterion, which was essentially done for pragmatic reasons given the lack of translation skills available to the trainee. Exclusion of papers in languages other than English can potentially bias review findings (Moher, Pham, Lawson, & Klassen, 2003) and so future work with appropriate resources should seek to remedy this limitation. The review also focused solely on published papers, rather than unpublished manuscripts or works in progress. Again, this was largely for pragmatic reasons but also to ensure the quality of the review contents, including only those that had successfully navigated the rigorous peer review processes. However, this may have increased the likelihood of the 'file drawer' problem (Rosenthal, 1979) biasing the results of the review to those papers reporting significant findings. Although a publication bias analysis was considered as part of the meta-analysis, this was not undertaken due to the limited number of small

studies, associated limited statistical power to test effects and narrow range of study size (Egger et al., 1997; Sterne et al., 2000).

3.3.2 Quality assessment process

Despite inherent limitations, Randomised Controlled Trials (RCTs) are still regarded as the gold-standard research design (Grossman & Mackenzie, 2005; Kaptchuk, 2001; Slade & Priebe, 2001) and are often the core evidence base upon which NICE Guidelines are based. Therefore, it is not surprising that quality assessment tools have been designed primarily to appraise this type of study design and its intricacies. However, this renders them less useful for critically evaluating the quality of studies with alternative designs, such as observational group-difference studies, or cross-sectional association studies, or even longitudinal prospective studies. The tool used in paper one was selected as it offered a valid instrument which could be used flexibly given study design (Armijo-Olivo et al., 2012; Deeks et al., 2003; B. H. Thomas et al., 2004); although, it remains principally concerned with RCTs and therefore arguably not adept at distinguishing between studies that score low in terms of randomised designs, rendering a rather blunt tool for the current purpose. As the field is acknowledging the value of other types of research design (Grossman & Mackenzie, 2005; Verhoef, Casebeer, & Hilsden, 2002) and seeks to synthesise the findings produced by these, it follows that a quality assessment tool designed to reliably and validly assess characteristics of these divergent study types be developed, in order to enhance systematic reviews in this complex area.

3.4 Experimental paper

3.4.1 Peer review and ethical approvals

As a requirement of the programme of study and university research governance procedures, the study outlined in paper two was presented to the Clinical Psychology Doctorate (ClinPsyD) Research subcommittee on 7th October 2013. The committee comprised a group of course team academics, a trainee representative, and a service user consultant, who were provided with the research proposal form (appendix 12) in advance and critiqued this as part

of discussions with the trainee. This process resulted in a number of recommendations, each of which we addressed in a revised proposal (appendix 13) and response letter (appendix 14). Specifically, the recommendations included incorporation of potential confound by trait voice-hearing proneness into the analysis strategy, exclusion of participants who had seen the video footage previously and the removal of an additional study component. The revised statistical analyses included the option to incorporate trait-level hallucination proneness into the multivariate analysis plan as a confounding factor, achieved post-hoc rather than via targeted recruitment so as to reduce pressure on recruitment procedures. Participants who had viewed the film from which the footage was drawn were excluded in order to reduce the confounding impact this might have, which might include mitigation of the film's traumatic qualities. The additional study component comprised a self-report daily diary to monitor intrusions and experiences in the seven days following the initial experimental session, in order to assess any longer term effects. As a result of the committee's advice, and on revisiting the literature, the diary component was removed from the study. This was based on the understanding that participants are unlikely to record psychotic-like experiences (such as pseudo-voices) without the provision of anomalous audio material and during an extended assessment period. Previous studies have already measured the impact of rumination on subsequent intrusions (rather than voice-hearing); therefore, analyses of this kind would not add anything novel, despite a notable amount of effort required from both the trainee and participants to facilitate a diary phase. Moreover, other authors have reported on the relatively low number of intrusions during this extended assessment period, and variable compliance rates (Ball & Brewin, 2012; Holmes & Steel, 2004; Laposa & Rector, 2012; Zetsche et al., 2009), which would make the production of viable datasets even less likely.

Following these amendments, the study was approved by the subcommittee (appendix 15), providing peer-reviewed endorsement of the proposal and fulfilling criteria for submission to the University of Manchester research ethics committee. The committee reviewed the proposal and

application form (appendix 16), detailing the particular ethical considerations inherent to the study design. The committee requested that it be emphasised that participants would be signposted to their GP if they disclosed trauma experience during the screening process, but that this would not be compulsory and that the research team would not shoulder responsibility for ensuring or encouraging attendance. The project was duly approved (appendix 17) and therefore permission granted to recruit University of Manchester student and staff, who were made aware of the opportunity via posters, volunteering website advertisements and the psychology student participation credits scheme.

3.4.2 Patient and public involvement

Patient and public involvement in the delivery of services and research that support their development and improvement is a key objective for the Department of Health (1999). Alongside policy drivers, there are indications that involvement can provide rewards for the study participants, investigators, the research field, service users themselves and those whose views they seek to represent (see for example, Glasby & Lester, 2004; Mockford, Staniszezwska, Griffiths, & Herron-Marx, 2012). Arguably, there is also an ethical and moral impetus to support the empowerment of individuals whom have previously been marginalised, to tackle the stigma that still clings to mental health problems (especially psychosis; Pyle & Morrison, 2013; Wood et al., 2014) and to ensure the relevance of research aims according to those it is commissioned to support. Service user involvement was garnered in a number of ways in the context of the current body of work. The Clinical Psychology programme at the University of Manchester incorporates a Community Liaison Group (CLG); a forum of current and ex-service users of varying backgrounds who consult to the programme team and trainees. Trainees were given the opportunity to submit study proposals to the group for review prior to approval. The experimental study described in paper two was presented to the group, who made a number of suggestions, which were incorporated into the study design. Firstly, the group suggested to place an emphasis on future possible patient benefit and to be explicit about dissemination plans. This was achieved by

stating plans to offer a newsletter to participants outlining the study findings, and to submit the paper to a national conference and peer-reviewed journal. Patient benefit was not offered directly by the study, although possible implications for modifications to intervention strategies were outlined. Specifically related to the possibility of distress resulting from the study procedure, the CLG advised that the research team should inform student services about the study in advance, to facilitate use of their support options, as were signposted in the participant information sheet. Moreover, the research team opted to screen out those who might be at most 'risk' of adverse effects, implemented via the exclusion of those with a history of/ current contact with secondary care services and previous similar trauma.

In addition to review by the CLG, the initial study design for paper two was presented to the Psychosis Research Unit (PRU) conference day at the University of Manchester. PRU is a group of academics, clinicians, researchers and service-user researchers based in Greater Manchester West NHS Mental Health Foundation Trust, who operate a number of research streams aimed at improving psychological support for those experiencing psychosis. The group's conference day was an opportunity to gather views on the study proposal from one of the leading research groups in the field. The study rationale, aims, design and methods were presented, sparking a number of suggestions that were subsequently incorporated to the proposal. These included having a measure of trait-level rumination so as to control for the confounding influence of this on the effectiveness of the rumination induction, should it differ between groups. Importantly, the overall rationale for the study was endorsed as a useful endeavour and one that could contribute to wider understanding and future intervention strategies.

3.4.3 Experimental designs

Experimental designs offer a rare opportunity to explore the causal influence of one variable on another. Manipulating a single variable and measuring the effects on outcome permit the investigator to avoid the ambiguity of direction of effects that plagues cross-sectional research. In the current study, use of a randomised experimental design allowed an insight into the impact of different

processing styles on the experience of voices, associated distress and paranoia. Random allocation to groups was used to undermine the possibility of additional group differences confounding any effects, and checks were made to ensure that this was effective. This type of study is quite resource-intensive, relying as it does on stringent methodological design and control of the experimental manipulation of complex thought processes and investigative paradigms. It might therefore not be the first step in a hypothesis-driven research programme; although, the current study sought to extend previous work which has already demonstrated cross-sectional links or group differences, building on the evidence base as it stands.

3.4.4 Analogue samples

Given the understanding that psychosis-like phenomena operate on a continuum within the general population (Verdoux & van Os, 2002), the use of analogue samples is prolific in this area. The use of non-clinical participants offers a comparatively efficient way to recruit a well-powered, medication-naïve sample that might also relieve some of the confounding effects of long-term antipsychotic use (Hill, 1986; Ho, Andreasen, Ziebell, Pierson, & Magnotta, 2011; Lieberman et al., 2005; Newcomer, 2007; Reilly, Ayis, Ferrier, Jones, & Thomas, 2002; Weinmann & Aderhold, 2010), discrimination and social isolation (González-Torres, Oraa, Arístegui, Fernández-Rivas, & Guimon, 2007) that might be associated with clinical populations. However, these methods are not without their limitations. Firstly, the continuum of experience account faces complications (Linscott & van Os, 2010) and is not yet a universally accepted model. Moreover, although a general population sample might offer a representative group, a student sample- however convenient- may not. A student sample was employed in the current study as it offered a viable way of accumulating the participant number needed to reach statistical power; although, the use of these populations might actually be perpetuating over-representation of certain groups in the global research field (Henrich, Heine, & Norenzayan, 2010). The current study captured a higher level of non-White British participants than is represented in the general population (Census 2011), and an over-representation of women, which mirrors other university-

level psychology courses, which was the source of the majority of the current sample (Sander & Sanders, 2007). In summary, the use of a student sample offered an efficient method to complete the study and fits with current theoretical understanding of the distribution of psychotic-like phenomena. However, caution should still be taken in extrapolating the results to the population as a whole.

3.4.5 Reflections on the experimental design

Given that one of the main strengths of experimental research is the ability to rigorously control the design and thus produce findings that can tap causal pathways, it follows that the intricacies of this design hold prominence in the study and thus require thorough consideration. Reflections on a number of these design decisions are explored below.

3.4.5.1 Overall study procedure

The procedure for the experimental study is reported in detail in paper two. This moved away from investigating the maintenance of symptoms experimentally (e.g. Martinelli et al., 2013) to establishing whether rumination was involved in their initial development, which inevitably is a more stringent test of influence but also fills a distinct gap in the literature. Utilising the design features including the provision of stressful film material and auditory stimulus, a maintenance design would not be appropriate; participants were expected to ruminate on a film clip and then experience intrusions as words, given the provision of anomalous material, rather than experience voice-type phenomena immediately after the film, which could be maintained by rumination. In order to reduce bias, the procedure was standardised by the use of Microsoft PowerPoint, which presented the video clip, induction prompts, auditory materials, debriefing materials and instructions for each stage of the experiment (see appendices 9 and 10).

3.4.5.2 Film content

The film material upon which half the participants were subsequently asked to ruminate consisted of the presentation of a 4 min 33 second clip from 'The

Brave One'; an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple. The film was selected by the current author, after review of a number of options. Criteria for selection included the film depicting trauma of a kind that has been associated with predisposition to psychotic experiences, likely to elicit distress within ethical limits, approved for cinema release and therefore appropriate for general public viewing, unlikely to have been viewed by the majority of the target population (i.e. not an overly popular film) but likely to be relevant to the target population (a largely <20, mixed gender, mixed ethnicity student population), containing a clip of length <10 minutes and comprising a discernible self-contained plot and depiction of violence. The clip was selected as it was thought to echo the interpersonal nature of trauma that people with psychosis have often experienced (Bentall et al., 2012; Varese et al., 2012), as opposed to the 'accidental' vehicular or industrial incidents often utilised in PTSD literature (Weidmann et al., 2009). The clip was viewed by six informal contacts (including males, females, students and non-students, a range of ages) of the current author, who suggested it depicted an appropriate level of violence that they were able to tolerate viewing but did elicit some stress and they could imagine thinking about afterwards (for a full summary of this pilot, see appendix 18). A number of other options were dismissed. Video clips of warfare were excluded as they were judged to be too far removed from a scenario the target population could envisage themselves being party to (and therefore possibly more difficult to ruminate on). A film depicting the rape of a woman and rated as highly distressing and efficacious for producing pseudo-trauma responses accordingly to empirical study (Weidmann et al., 2009) was excluded as it was felt to push the boundaries of ethical research conduct, and moreover might be differentially effective with males and females given that the target of the violence was exclusively female.

3.4.5.3 Random allocation

Random allocation permits the investigation of the influence of key variables and the equal distribution of other potentially confounding variables among groups such that their influence is reduced or eradicated. Participants in paper two were randomised using a computer-generated block design with random-

sized blocks varying from two to eight subjects. An important assumption is that randomisation will result in similar levels of other characteristics between the groups. However, this can be insufficient if there are confounding variables that may not follow this pattern or are explicitly required to be equally distributed and might be subject to 'chance bias' (Torgerson & Torgerson, 2003), which describes a scenario when randomisation, by chance, results in groups which are not balanced in important co-variables. This can be remedied by the use of stratified random allocation, wherein participants are randomised in blocks, with separate blocks for different subgroups. Stratification was not used in study two due to inherent difficulties in estimating baseline characteristics with rolling recruitment methods and relatively small group sizes (Suresh, 2011). To accommodate this, planned multivariate analyses would incorporate the inclusion of key confounding variables, where these were shown to be influential in the hypothesis test of interest and where preliminary analysis demonstrated that they differed between groups.

Random allocation is often accompanied by 'blinding' of the experimenter and/or participant, such that there is no knowledge of the group the participant has been allocated to. This avoids the intentional or unintentional biasing of results based on this knowledge. Blinding was not used as part of the current study, essentially for pragmatic reasons given there was only one experimenter. It was also regarded as a low risk decision given that there were no subjectively-rated outcome variables (apart from the content analysis, which was conducted by an independent, blind researcher), and the presentation of the experimental procedures was standardised. Participants were not made aware of the study hypotheses prior to the experimental phase and were also not explicitly told which group they were allocated to (or that there was more than one group), in order to mitigate the impact of demand characteristics.

3.4.5.4 The rumination and distraction induction

The manipulation of post-film processing was the key to the design of the study described in paper two, with half the sample induced to ruminate on the video

contents and half encouraged to distract themselves; both conditions lasting for 12 minutes. Rumination inductions have been demonstrated to be effective in the PTSD literature, where verbal prompts have been used to encourage rumination or distraction (Zetsche et al., 2009). Given the difference in film content and study rationale, it would not have been appropriate to simply replicate the prompts used previously. Instead, prompts were generated by the first author, including “What if I was attacked like the couple were?”; “Why do people have to be so violent?”; “How would I cope if that happened to me?”. The relevance of these ruminations for post-trauma experiences was explored by presenting the draft prompts to a group of 13 Clinical Psychology Doctorate trainees, who have theoretical and practical experiences of traumatic reactions. The full cohort of 24 trainees was invited to respond anonymously to a series of questions via Survey Monkey; scoring the items from 0 (not at all realistic/ appropriate) to 4 (completely realistic/ appropriate) and providing text responses with reflections/ additional items. Feedback indicated that none of the initial nine items were rated as inappropriate, although one typo was corrected and the use of the word ‘trauma’ was changed to ‘effects’ so as to be more inclusive of the potential range of experiences. Three additional items were also included; a full list of the original and final items can be seen in appendix 19.

Replicating previous designs (Zetsche et al., 2009), the distraction condition was induced using a series of general knowledge questions (appendix 20), designed to appear on screen for a total of 12 minutes, mirroring the rumination induction.

The manipulation was successful, with the rumination group reporting significantly more perseverative thought regarding the film content compared to the distraction group, as reported in paper two. However, there are potential drawbacks to using distraction as a comparator condition. Distraction (focus on another task) might have inadvertently encouraged suppression of film-related thoughts in some individuals, which could have backfired and resulted in more intrusions (Wegner et al., 1987). Other potential alternative conditions could include mindful awareness of intrusions, which can be engendered over short

time periods (Broderick, 2005; Wahl et al., 2013) or self-compassion (Odou & Brinker, 2014); although, the need to remain allied to validated study designs as much as possible and the unfeasibility of a third study arm meant this option was not implemented here. In addition to possible suppression, there might have been unforeseen outcomes delivered by the distraction induction that could have confounded the experimental auditory task. For example, the ‘quiz’ format to the general knowledge questions might have increased motivation to achieve, which subsequently meant participants were motivated to ‘find’ words in the auditory task. Alternatively, people might have been stressed by the questions or worried about their performance, increasing arousal levels which could have affected experiences during the auditory task. Collecting data on arousal levels and motivation could have permitted exploration of these potentially confound influences but would have also increased the time lag between induction and outcome assessment, thus mitigating any causal influence derived from the manipulation.

3.4.5.5 Auditory paradigm

The auditory paradigm used in study reported in paper two has previously been validated (Feelgood & Rantzen, 1994) and used in a number of subsequent investigations (e.g. Campbell & Morrison, 2007). It was selected as it offered an anomalous auditory stimulus that could, in theory, be experienced in tandem with cognitive intrusions to produce misattributed inner thoughts that are subsequently experienced as speech. The task was successful, producing an average level of recordings similar to that reported in the original study (median of 4.00 in the current study whole sample compared to a mean of 4.33 in the ‘high’ proneness group of Feelgood & Rantzen, 1994), with levels significantly correlated to trait hallucination proneness. However, there are alternatives, such as source monitoring paradigms (Sugimori, Asai, & Tanno, 2011) or newly developed materials that might provide more ecologically valid experiences (Huque et al., 2014), as well as additional confounding variables to account for, such as reality discrimination (Smailes, Meins, & Fernyhough, 2015). Future work might wish to replicate the study incorporating these alternatives.

Several intricacies of the design of the task also warrant critical reflection. In order to collect the data regarding voice-hearing instances, participants were provided with a proforma (appendix 8) and instructed to record words and phrases, along with associated distress. In order to ensure accurate recordings and standardise these, this was formatted in a table over two sheets. The limitation of this method is that it may have provided an idea of the level of data 'expected', which could have promoted demand characteristics; although, the large spread of data (Range of number of recordings= 30) suggests that this was not actually the case. An additional consideration is the nature of the data sought; frequencies of recordings, thematic overlap with the film content and associated distress. Although this provided a range of testable hypotheses, it also neglected other aspects of voice-hearing experiences, such as beliefs regarding the power or origin of the voice, or its location and loudness; in other words, the phenomenological, cognitive and emotional sequelae to the simple recording. Future work might seek to explore these characteristics. Although, additional data recording might also reduce the effectiveness of the paradigm, increasing as it does the temporal distance from the initial stimuli. The content analysis provided an opportunity to explore qualitative aspects of the voice-hearing experience and, as part of a theoretically driven hypothesis, their convergence with the film contents. An extension to this might be to analyse convergence with likely rumination themes (i.e. the 'answers' to the rumination prompts) rather than the film content; although, this would be difficult to prospectively standardise across individuals.

3.4.6 Results

Despite effective planning and execution, the experimental study did not produce significant findings. A key theoretical implication is that rumination is not involved in the development of experiences, although possibly their maintenance. However, there are other viable reasons for the lack of significant findings, which have been considered briefly in paper two but warrant further exploration outside the confines of journal word limits. It might be that those induced to ruminate also experienced increased levels of low mood; this may have engendered apathy and a lack of motivation, which could have hindered

engagement in the auditory task. In contrast, the distraction 'quiz' might have encouraged participation via increased competitiveness and motivation, enhancing engagement. Alternatively, participants may have found the distraction task distressing due to its emphasis on personal knowledge, which could have elevated general arousal levels in the same way that the rumination prompts may have done, thus negating any group differences. In addition, it might be that distraction actively suppressed processing (rather than failing to encourage it); it is possible that any processing (even of the negative, perseverative variety) following stressful events is 'better than nothing', although previous work in the PTSD field does not support this suggestion (Laposa & Rector, 2012; Zetsche et al., 2009). Finally, as has been highlighted previously, it may be that negative beliefs regarding processing strategies are as, if not more, important as the type of processing that is engaged in, with negative beliefs regarding rumination seen as particularly unhelpful (Papageorgiou & Wells, 2003).

3.4.7 Planned multivariate analysis strategy

The results of the initial analyses indicated that the null hypotheses could not be rejected. Considering a lack of statistical significance at this stage, it was inappropriate to conduct the planned multivariate analyses that were selected to control for confounding influences and explore possible moderating relationships; there was no relationship to be moderated. Had the preliminary tests shown significant differences between the experimental groups, or significant relationships with the potential confounding or moderating variables, then a multivariate analyses strategy would have been employed. This could be achieved with either Analysis of Covariance (ANCOVA) or Hierarchical multiple regression, which in this context would execute essentially the same analyses. Employing a hierarchical multiple regression model and stepwise entry, any significant demographic or trait-level variables would be entered in the first step, followed by a dummy variable of experimental condition, then the moderator variable (metacognitive beliefs) followed by the interaction term of condition x metacognitive beliefs. This follows procedures previously outlined (Frazier, Tix, & Barron, 2004) and

would benefit from the variables being standardised prior to entry so as to reduce the effects of multicollinearity. The results would therefore demonstrate whether the experimental condition had an effect over and above any trait-level factors and if the group difference was moderated by beliefs regarding intrusions and thoughts (i.e. if the interaction term was significant).

3.5 Dissemination and participant engagement

There is an ethical imperative to inform study participants of research findings (Fernandez, Kodish, & Weijer, 2003). Participants in the current study were assured that their contribution to the research would support the development of understanding, theoretical knowledge and possibly future treatment opportunities. Following confirmation of the study findings, participants were sent a newsletter outlining the study findings and inviting any questions (appendix 21). As a token of appreciation for taking part, participants outside of the university credits scheme were offered either a prize draw for a high street voucher or a seminar relating to clinical psychology careers. The prize draw was made within a month following the end of recruitment and the winners informed; the dissemination email also highlighted that this had taken place so that those not successful were aware the offer had been adhered to. The seminar was delivered on 27th March 2015 and welcomed by those who attended. Maintaining a relationship between researcher, target populations and the general public is essential to fostering effective links, ethically-sound research, the feasibility of future research efforts and a positive public face of research, therefore the current author made sure to deliver on the offers made in recruitment materials.

Wider dissemination of the study findings will be achieved by presentation of a scientific poster at the British Association for Behavioural and Cognitive Psychotherapies (BABCP) annual conference, the abstract for which has already been accepted (appendix 22). The current author has also submitted both the systematic review paper and experimental paper for publication in peer reviewed journals: *Clinical Psychology Review* and *Journal of Behavior Therapy and Experimental Psychiatry*, respectively.

3.6 Clinical implications and directions for future research

The rationale for the current body of work was derived from theoretical understanding of negative perseverative processing, psychosis and potential links between the two, with the overarching aim to deliver findings that could contribute to more effective therapeutic interventions. The systematic review of the literature has demonstrated the relevance of worry and rumination in the realm of psychosis and underlined the importance of this course of study. The experimental paper reports a lack of significant findings, which warrant replication with minor adaptations to the study design to rule-out any additional confounding factors. If replicated, the necessary conclusion is that rumination is not involved in the development of auditory hallucinations and therefore targeting it in a prospective manner is unlikely to be therapeutically fruitful. Nevertheless, in light of previous findings and not negated by the current results, rumination might be involved in the maintenance of such experiences. Future work therefore is required to experimentally test this hypothesis; inducing voice-hearing phenomena, examining their nature and associated distress, encouraging participants to ruminate on this experience and its contents and subsequently testing the outcome of this (against an appropriate control condition/s). An additional avenue might be to explore the longitudinal links, recruiting a sample of people experiencing a first episode of psychosis with prodromal hallucinatory experiences and measuring levels of rumination in order to assess its prospective influence on the course of symptom development. Finally, piloting the use of rumination-reduction techniques (such as psychoeducation, encouraging divergent processing strategies or modifying beliefs about its efficacy) in those currently experiencing auditory hallucinations would provide an opportunity to rigorously test its causal influence; analysing the association between any change in ruminative processing and change in symptom severity or distress.

3.7 Personal reflections

My previous experience completing a PhD and working in clinical research provided a solid foundation of skills to drawn upon during the course of this thesis. This has allowed me to challenge myself by engaging in new processes,

such as meta-analysis, where a consistent adherence to research procedures and statistical analysis has been paramount. Finding supervisors who shared my interests, I was able to develop a research idea that built on the work I had done prior to my doctoral training, emulating the continuity of programmatic research and thus delivering findings that derive from a strong rationale and offer a significant contribution to the field. My past work had involved large datasets; cross-sectional, longitudinal and momentary. The use of an experimental design in the current body of work allowed me to hone-in on a very specific research question, highlighting the value of targeted, hypothesis-driven testing and streamlining the analysis and writing stages. Producing a thesis alongside complex clinical work has solidified my values of curiosity, openness to new ideas and the belief that clinical intervention and research investigation should always go hand-in-hand; when academic musings gather pace, it is important to question how this will actually impact individuals using our services. I have enjoyed delivering a thesis that has allowed me to maintain a passion for the field and the research endeavour, alongside an academic distance that permits me to be constructively critical of my own and others' work.

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5. Appendices

Appendix 1: EPHPP Tool

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES



COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

- 1 Very likely
- 2 Somewhat likely
- 3 Not likely
- 4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?

- 1 80 - 100% agreement
- 2 60 - 79% agreement
- 3 less than 60% agreement
- 4 Not applicable
- 5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design

- 1 Randomized controlled trial
- 2 Controlled clinical trial
- 3 Cohort analytic (two group pre + post)
- 4 Case-control
- 5 Cohort (one group pre + post (before and after))
- 6 Interrupted time series
- 7 Other specify _____
- 8 Can't tell

Was the study described as randomized? If NO, go to Component C.

No Yes

If Yes, was the method of randomization described? (See dictionary)

No Yes

If Yes, was the method appropriate? (See dictionary)

No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?

- 1 Yes
- 2 No
- 3 Can't tell

The following are examples of confounders:

- 1 Race
- 2 Sex
- 3 Marital status/family
- 4 Age
- 5 SES (income or class)
- 6 Education
- 7 Health status
- 8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

- 1 80 – 100% (most)
- 2 60 – 79% (some)
- 3 Less than 60% (few or none)
- 4 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

- 1 Yes
- 2 No
- 3 Can't tell

(Q2) Were the study participants aware of the research question?

- 1 Yes
- 2 No
- 3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?

- 1 Yes
- 2 No
- 3 Can't tell

(Q2) Were data collection tools shown to be reliable?

- 1 Yes
- 2 No
- 3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

- 1 Yes
- 2 No
- 3 Can't tell
- 4 Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

- 1 80 -100%
- 2 60 - 79%
- 3 less than 60%
- 4 Can't tell
- 5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

- 1 80 -100%
- 2 60 - 79%
- 3 less than 60%
- 4 Can't tell

(Q2) Was the consistency of the intervention measured?

- 1 Yes
- 2 No
- 3 Can't tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

- 4 Yes
- 5 No
- 6 Can't tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)

community organization/institution practice/office individual

(Q2) Indicate the unit of analysis (circle one)

community organization/institution practice/office individual

(Q3) Are the statistical methods appropriate for the study design?

- 1 Yes
- 2 No
- 3 Can't tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

- 1 Yes
- 2 No
- 3 Can't tell

GLOBAL RATING**COMPONENT RATINGS**

Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

A	SELECTION BIAS	STRONG	MODERATE	WEAK
		1	2	3
B	STUDY DESIGN	STRONG	MODERATE	WEAK
		1	2	3
C	CONFOUNDERS	STRONG	MODERATE	WEAK
		1	2	3
D	BLINDING	STRONG	MODERATE	WEAK
		1	2	3
E	DATA COLLECTION METHOD	STRONG	MODERATE	WEAK
		1	2	3
F	WITHDRAWALS AND DROPOUTS	STRONG	MODERATE	WEAK
		1	2	3
				Not Applicable

GLOBAL RATING FOR THIS PAPER (circle one):

- | | | |
|---|----------|----------------------------|
| 1 | STRONG | (no WEAK ratings) |
| 2 | MODERATE | (one WEAK rating) |
| 3 | WEAK | (two or more WEAK ratings) |

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

If yes, indicate the reason for the discrepancy

- | | |
|---|---|
| 1 | Oversight |
| 2 | Differences in interpretation of criteria |
| 3 | Differences in interpretation of study |

Final decision of both reviewers (circle one):

- | | |
|---|----------|
| 1 | STRONG |
| 2 | MODERATE |
| 3 | WEAK |

Appendix 2: EPHPP Quality Assessment Ratings

Paper	<u>Selection bias</u>	Study design	<u>Confounders</u>	Blinding	<u>Data</u>	Withdrawals	Overall quality rating	Adapted quality rating
Badcock 2011	2	3	2	2	1	2	2- Moderate	1- Strong
Bassett 2009	3	3	3	2	1	2	3- Weak	3- Weak
Bell 2011	2	3	3	2	1	2	3- Weak	2- Moderate
Carse 2013	3	3	2	2	2	2	3- Weak	2- Moderate
Flower 2015	3	3	3	2	1	1	3- Weak	3- Weak
Foster 2010	2	1	3	3	1	1	3- Weak	2- Moderate
Freeman 1999	3	3	3	2	3	2	3- Weak	3- Weak
Freeman 2008	2	3	3	2	1	2	3- Weak	2- Moderate
Freeman 2008	2	3	1	2	1	2	2- Moderate	1- Strong
Freeman 2010	2	3	3	2	1	2	3- Weak	2- Moderate
Freeman 2010	2	3	1	2	1	2	2- Moderate	1- Strong
Freeman 2011	1	3	3	2	1	2	3- Weak	2- Moderate

Freeman 2012	2	3	2	2	1	2	2- Moderate	1- Strong
Freeman 2013	2	3	3	2	1	2	3- Weak	2- Moderate
Freeman 2015	2	1	2	2	1	1	1- Strong	1-Strong
Halari 2009	2	3	3	2	1	2	3- Weak	2- Moderate
Hartley 2014	2	3	3	2	3	1	3- Weak	3- Weak
Jones 2009	3	3	2	2	1	2	3- Weak	2- Moderate
Martinelli 2013	3	3	2	3	1	2	3- Weak	2- Moderate
Melo 2010	3	3	2	2	1	2	3- Weak	2- Moderate
Morrison 2000	2	3	3	2	1	2	3- Weak	2- Moderate
Morrison 2007	2	3	3	2	1	2	3- Weak	2- Moderate
Newman-Taylor 2009	3	3	2	2	1	2	3- Weak	2- Moderate
Ricarte 2014	3	3	2	2	1	1	3- Weak	2- Moderate
Rowland 2013	2	3	2	2	1	2	2- Moderate	1- Strong
Startup 2007	2	3	3	2	1	1	3- Weak	2- Moderate
Vorontzova 2013	2	3	3	2	1	1	3- Weak	2- Moderate

Ruminative processing in psychosis

planning an experimental study

Sam Hartley PRU April 2013

What is rumination?

- *Response style: behaviours and thoughts that focus one's attention on one's depressive symptoms and on the implications of these symptoms*

Nolen-Hoeksema, 1991

- *Class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts*

Martin, Tesser and Wyer, 1996

- *Driven by executive processing and metacognitions that support self-reflective, emotion-focussed processing as a coping strategy*

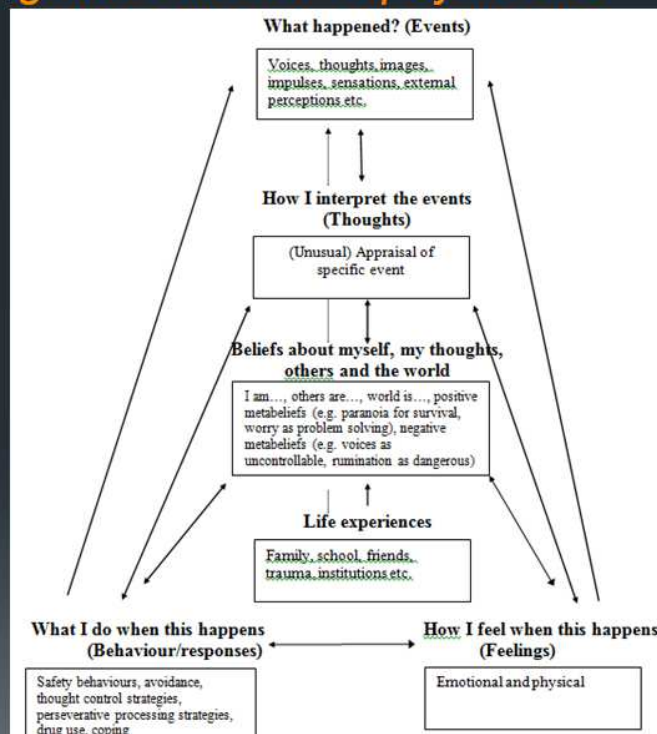
SREF model- Wells and Matthews, 1996

- *Brooding vs. reflection (Treynor et al 2003); abstract vs. concrete (Watkins and Moulds, 2005)*

Consequences of rumination

- Increases or maintains depressed mood
- More negative interpretations of past events and pessimistic view of the future
- Poorer problem solving, especially if 'abstract' in style
- Lower levels of concentration and more cognitive intrusions
- Interferes with suppression in executive functioning
- Attentional bias towards negative information
- Negative perceptions of social encounters
- Links with cognitive and behavioural avoidance

A cognitive model of psychosis



Rumination in psychosis

- *Jones and Fernyhough 2009:*
 - *Cross-sectional path analysis with ~300 students*
 - *Rumination associated with hallucination proneness via intrusive thoughts*
 - *Rumination linked directly with intrusions and also via suppression*
- *Hepworth et al 2011:*
 - *Intervention to encourage emotional processing in those experiencing persecutory delusions*
 - *All 12 pts scored in clinical range for rumination, but not significantly reduced by the intervention*

Rumination in psychosis

- *PhD findings:*
 - *Rumination in a group meeting criteria for a diagnosis of psychosis: scores not significantly different from depressed groups previously reported*
 - *Rumination linked with baseline auditory hallucination severity and change in this over 9 months (but not independently of negative beliefs about rumination)*
- *ESM study:*
 - *Group currently experiencing symptoms (persecutory ideas and/ or auditory hallucinations)*
 - *Rumination at one time point positively associated with the severity and distress of auditory hallucinations at the subsequent time point*
 - *More naturalistic, indicates acute maintaining/triggering role?*

Trauma

- Large evidence base of a role for trauma in the experience of psychosis (Varese, 2012; Bentall, 2012)
- Ruminative processing is a maintaining factor for PTSD (Ehring et al, 2008; Ehlers and Clark 2000):
 - Form of cognitive avoidance
 - Prevents elaboration of trauma memories- uninhibited intrusions
 - Strengthens negative appraisals
- Voices often share content with past traumas (Hardy, 2005)
- Fowler, 2006: suggestion that ruminative thoughts concerning the events of past traumas may be falsely interpreted as voices

Planning an experimental study

- If we induce people to ruminate after being exposed to stressful material, does this lead to intrusions similar to those in psychosis?
 - How are these intrusions interpreted?
 - Are people distressed by them?
 - Are these links moderated by pre-existing beliefs about intrusions?
- Previous evidence that levels of rumination are linked to more intrusive memories following stressful video (Zetsche 2009; Laposa and Rector, 2012) - does this extend to voice hearing type experiences given anomalous material and pre-existing beliefs?
- Population
 - Students
 - Screen for proneness (LSHS/ schizotypy)? Pre-existing beliefs?

Planning an experimental study

- *Stressful material- Video clip*
 - *Brewin and Saunders 2001- aftermath of road traffic accidents*
 - *Wells 1991- workplace accident*
 - *Laposa and Rector 2012- hospital procedures following accident*
- *Rumination induction- randomly allocated*
 - *Response styles- focus on the way you feel/ sensations- too theoretically specific?*
 - *Tie to content of video (e.g. Guastella, & Moulds 2007)*
 - *think about your reactions while watching the video/ what might have happened if you were in that situation*
 - *Visual aid: sentences representing ruminative thoughts related to the video- dwell on implications, or drift to related issues and associated thoughts- 'why' 'what if' (Zetsche 2009)- can be abstract/ concrete*
 - *Manipulation check: Perseverative Thinking Questionnaire-State Version (Ehring, 2007); independent ratings of experiences (blinded)*
 - *Compare with distraction condition*
 - *Also induce another processing style- mindful acceptance/ detached mindfulness?*

Planning an experimental study

- *Outcome measures*
 - *Frequency of intrusions*
 - *How to operationalise?*
 - *Period (minutes/ take away diary?)*
 - *Intrusive memory questionnaire- Michael and Ehlers 2007*
 - *Interpretation of intrusions- meaning? self-generated? troubling?*
 - *Utilise source monitoring exercise/ White noise/ spliced backwards audio recording (e.g. Feelgood and Rantzen 1994)*
 - *Link to video material?*
- *Other measures*
 - *Beliefs about intrusions/ cognitive processes: MCQ? - especially thought control and cognitive self-consciousness - as moderating factor?*
 - *Distress- subjective units of distress*
- *Other considerations*
 - *Distress as a result of procedure*
 - *Debriefing*



Ideas/ questions/ suggestions?

samantha.hartley@manchester.ac.uk

Appendix 4: Study advert



Version 2; 30/7/14; UREC Reference 14054

Reactions to stressful events **Research Participation**

Want to find out more about why some people get more upset than others after stressful events?

Want to learn more about a career in clinical psychology, or have a chance to win a highstreet voucher?

We are interested in the way that people think about emotional material and how this can impact on their experiences following the event. Although we are using only mildly distressing material, we hope that our findings can in future be applied to help develop services for people who have experienced traumatic events.

Who can take part?

- Student or staff at the University of Manchester
- 18 years old or over, English speaking
- Normal or corrected vision and hearing
- No current or historical involvement with secondary care psychiatric services

We also ask that people have not previously viewed the film material to be used in the current study ('The Brave One', certificate 18) and have not had personal experience of being physically assaulted.

What will it involve for me?

You will be asked to see a researcher for approximately 1 hour, on campus. The session will involve completing some questionnaires, watching a video and being asked to think about this in a certain way and listen to some audio material. You may complete these tasks alongside other students, but your answers will remain confidential.

Participants will also be eligible to receive entry to a clinical-psychology themed career seminar offered by two current Clinical Psychology Doctorate Trainees, with the opportunity to ask questions. Alternatively participants can elect to enter into a raffle with the chance of winning one of two high street gift vouchers, as a token of appreciation.

Further Information

If you would like to take part or have any questions about the study, please get in touch:
Dr Samantha Hartley Email: samantha.hartley@manchester.ac.uk

Appendix 5: Participant Information Sheet

Participant Information Sheet

Study Title: Reactions to stressful events

You are being invited to take part in a research study. Before you decide whether to take part it is important you understand why the research is being done and what it will involve. Please take time to read the following information carefully. We can go over it in more detail when we meet if you like. You can also discuss it with others if you wish. Ask us if there is anything that is not clear or you would like more information about. Take time to decide whether or not you wish to take part.

Why is the study being done?

The project as a whole aims to look at people's reactions to stressful events. In particular, we are interested in the way that people think about emotional material and how this can impact on their experiences following the event. Although we are using only mildly distressing material, we hope that our findings can in future be applied to help develop services for people who have experienced traumatic events.

Who will be taking part and why have I been asked to take part?

We are hoping for 102 students/staff members to take part in this study. We are inviting you to take part because you are a student or staff member at the University of Manchester and are 18 years old or over. People involved will also have normal or corrected vision and hearing, have no current or historical involvement with secondary care psychiatric services and be English speaking. We also ask that people have not previously viewed the film material to be used in the current study and have not had personal experience of being physically assaulted.

What will it involve for me?

You will be asked to see a researcher for approximately 1 hour. This will be at a central location on campus. The session will involve completing some questionnaires, watching a video (a clip from the film, 'The Brave One') and being asked to think about this in a certain way and listen to some audio material. Some of the questions ask if you have experienced certain distressing events (such as 'a really bad accident at home or work' or 'attacked with a gun knife or weapon') but you will not be asked to provide details of these. You may complete these tasks alongside other students or staff members, but your answers will remain confidential.

Do I have to take part?

It is up to you whether or not you decide to take part. If you do decide to take part you will be given a copy of this information sheet and be asked to sign a consent form. If you decide to take part you can leave the study at any time without giving a reason. If you decide to leave at any time, or not to take part, this will not affect your study at the University.

What are the good things and bad things about taking part?

This project will help us to understand more about how people's reactions to stressful events might lead to them coping or not coping well with them. We hope that this will inform ways of supporting people to maintain their wellbeing after stressful events and avoid negative, distressing experiences.

Participants will also be eligible to receive entry to a clinical-psychology themed career seminar offered by two current Clinical Psychology Doctorate Trainees, with the opportunity to ask questions. Alternatively participants can elect to enter into a raffle with the chance of winning one of two £50 high street gift vouchers, as a token of appreciation.

The study will involve watching a film excerpt involving distressing scenes (with physical violence), taken from an 18 certificate film (involving a physical assault on a male and female). In a pilot study, people generally rated this as 'moderately' (5/10) upsetting (on a scale of not at all- 0 to very much-10). We will also ask participants to listen to an audio recording and fill in questionnaires about their experiences and thought processes. Although prior research has not reported adverse effects, it might be that some participants find some of these tasks upsetting. If this is the case, the researcher can signpost participants to sources of support, including the University Student Services, NHS 111 Emergency Care number, or the Samaritans (Tel: 08457 90 90 90).

What do I do if something goes wrong?

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

In the event that something does go wrong and you are harmed during the research you may have grounds for a legal action for compensation against The University of Manchester but you may have to pay your legal costs. The University of Manchester has cover for no fault compensation for bodily injury, mental injury or death where injury has resulted from a trial or procedure you received as part of the trial. This would be subject to policy terms and conditions. Any payment would be without legal commitment. (Please ask if you wish to have more information on this). The University

would not be bound to pay this compensation where the injury resulted from a drug or procedure outside the trial protocol or the protocol was not followed.

Will my taking part be confidential?

If you agree to take part in the study, any information you give the researcher will be kept strictly confidential. We will conform to the Data Protection Act of 1998 with respect to data collection, storage and destruction. Your name will not appear on any of the forms, we will give you a study number instead. Any information you give to the researcher will not be shared with any staff without your consent, unless the researcher feels that either yourself or others are likely to be harmed.

What will happen to the results of the research study?

If you take part in the study you will be informed of the results. The findings will be presented to a range of mental health professionals and academics. It is hoped that the findings will improve mental health services. We also aim to publish the results of the study in a scientific journal and/or conference presentations.

Who is organising and funding the research?

This study is funded and organised as part of the University of Manchester Doctorate in Clinical Psychology Programme.

Further Information

If you would like any further information or have any questions about the study, please ask a member of the research team:

**Dr Samantha Hartley
(Researcher)**

**2nd Year Trainee, Doctorate in Clinical Psychology
Zochonis Building, 2nd Floor
University of Manchester
Brunswick street
Manchester
M13 9PL**

Email: samantha.hartley@manchester.ac.uk

Appendix 6: Screening tool

Demographic Questionnaire

Birthdate:/...../.....

(day) (month) (year)

1. Sex Male ☐ Female ☐

2. Current living status:

Living alone ☐ Cohabiting ☐ Living with parents ☐

Student accommodation ☐ Shared private accommodation ☐

3. Country of Birth

If not born in UK, where were you born (country)?

Which ethnic group do you most identify with?

British ☐ Caribbean ☐

Irish ☐ African ☐

Other white background ☐ Other Black Background ☐

Indian ☐ White and Black Caribbean ☐

Pakistani ☐ White and Black African ☐

Bangladeshi ☐ Other mixed background ☐

Other Asian Background ☐ Chinese ☐

Other Ethnic Group ☐

(please specify) _____

Specify your native language.....

4. Education

What is your highest level of education that you have completed?

- No qualifications ☐
- GCSEs, CSEs, or O-levels ☐
- A levels/ BTEC ☐
- Trade/apprenticeship ☐
- University degree ☐
- Other (please specify) _____ ☐

What is your current course of study?

_____ (Subject) _____ (Level, e.g. BA, PhD, MA)

If not a student, what is your role within the university?

5. Health

Have you in the past been, or are you currently a service user of secondary care psychiatric services?

No ☐ Yes ☐

If yes, what secondary service do you/ have you used?

6. Have you previously seen the 18 Certificate film entitled 'The Brave One'?

No ☐ Yes ☐

Trauma History Screen

The events below may or may not have happened to you. Circle "YES" if that kind of thing

has happened to you or circle "NO" if that kind of thing has not happened to you.

A. A really bad car, boat, train, or airplane accident	NO	YES
B. A really bad accident at work or home	NO	YES
C. A hurricane, flood, earthquake, tornado, or fire	NO	YES
D. Hit or kicked hard enough to injure - as a child	NO	YES*
E. Hit or kicked hard enough to injure - as an adult	NO	YES*
F. Forced or made to have sexual contact - as a child	NO	YES
G. Forced or made to have sexual contact - as an adult	NO	YES
H. Attack with a gun, knife, or weapon	NO	YES*
I. During military service - seeing something horrible or being badly scared	NO	YES
J. Sudden death of close family or friend	NO	YES
K. Seeing someone die suddenly or get badly hurt or killed	NO	YES
L. Some other sudden event that made you feel very scared, helpless, or horrified.	NO	YES
M. Sudden move or loss of home and possessions.	NO	YES
N. Suddenly abandoned by spouse, partner, parent, or family.	NO	YES

If you answered 'YES' to items D, E or H.....

- | | | |
|--|----|-----|
| 1. Did this occur within the last 12 months? | NO | YES |
| 2. If NO, are you still troubled by this experience? | NO | YES |

Appendix 7: Consent form

CONSENT FORM

Client Identification Number for this study:

Title of Project: Reactions to stressful events

Name of Researcher:

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet (Version 3; 30/7/14) for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights or study being affected. ☐
3. I give my consent for anonymised direct quotations from the task to be published. ☐
4. I understand that relevant sections of the data collected during the study may be looked at by individuals from the University of Manchester or from regulatory authorities where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data. ☐
5. I agree to take part in this study ☐

The following items are optional and will not affect participation in the current study:

6. I consent to my contact details being passed to the investigator of an allied study within the same research group, with the understanding that I have no obligation to take part ☐
7. I consent to be contacted about similar future projects within the same research group, with the understanding that I have no obligation to take part ☐

Name of Participant

Date

Signature

Name of Researcher

Date

Signature

1 copy for participant; 1 for researcher;

Appendix 8: Measures pack

1

RRS

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you *generally* do, not what you think you should do.

	1	2	3	4
	Almost never	Sometimes	Often	Almost always
5. Think "What am I doing to deserve this?"				_____
7. Analyze recent events to try to understand why you are depressed				_____
10. Think "Why do I always react this way?"				_____
11. Go away by yourself and think about why you feel this way				_____
12. Write down what you are thinking about and analyze it				_____
13. Think about a recent situation, wishing it had gone better				_____
15. Think "Why do I have problems other people don't have?"				_____
16. Think "Why can't I handle things better?"				_____
20. Analyze your personality to try to understand why you are depressed				_____
21. Go someplace alone to think about your feelings				_____

MCQ

This questionnaire is concerned with beliefs people have about their thinking. Listed below are a number of beliefs that people have expressed. Please read each item and say how much you *generally* agree with it by *circling* the appropriate number. Please respond to all the items, there are no right or wrong answers.

Sex: _____ Age: _____

	<i>Do not agree</i>	<i>Agree slightly</i>	<i>Agree moderately</i>	<i>Agree very much</i>
1. Worrying helps me to avoid problems in the future	1	2	3	4
2. My worrying is dangerous for me	1	2	3	4
3. I have difficulty knowing if I have actually done something, or just imagined it	1	2	3	4
4. I think a lot about my thoughts	1	2	3	4
5. I could make myself sick with worrying	1	2	3	4
6. I am aware of the way my mind works when I am thinking through a problem	1	2	3	4
7. If I did not control a worrying thought, and then it happened, it would be my fault	1	2	3	4
8. If I let my worrying thoughts get out of control, they will end up controlling me	1	2	3	4
9. I need to worry in order to remain organised	1	2	3	4

	<i>Do not agree</i>	<i>Agree slightly</i>	<i>Agree moderately</i>	<i>Agree very much</i>
10. I have little confidence in my memory for words and names	1	2	3	4
11. My worrying thoughts persist, no matter how I try to stop them	1	2	3	4
12. Worrying helps me to get things sorted out in my mind	1	2	3	4
13. I cannot ignore my worrying thoughts	1	2	3	4
14. I monitor my thoughts	1	2	3	4
15. I should be in control of my thoughts all of the time	1	2	3	4
16. My memory can mislead me at times	1	2	3	4
17. I could be punished for not having certain thoughts	1	2	3	4
18. My worrying could make me go mad	1	2	3	4
19. If I do not stop worrying thoughts, they could come true	1	2	3	4
20. I rarely question my thoughts	1	2	3	4
21. Worrying puts my body under a lot of stress	1	2	3	4
22. Worrying helps me to avoid disastrous situations	1	2	3	4
23. I am constantly aware of my thinking	1	2	3	4
24. I have a poor memory	1	2	3	4
25. I pay close attention to the way my mind works	1	2	3	4
26. People who do not worry, have no depth	1	2	3	4
27. Worrying helps me cope	1	2	3	4
28. I imagine having not done things and then doubt my memory for doing them	1	2	3	4
29. Not being able to control my thoughts is a sign of weakness	1	2	3	4

	<i>Do not agree</i>	<i>Agree slightly</i>	<i>Agree moderately</i>	<i>Agree very much</i>
30. If I did not worry, I would make more mistakes	1	2	3	4
31. I find it difficult to control my thoughts	1	2	3	4
32. Worrying is a sign of a good person	1	2	3	4
33. Worrying thoughts enter my head against my will	1	2	3	4
34. If I could not control my thoughts I would go crazy	1	2	3	4
35. I will lose out in life if I do not worry	1	2	3	4
36. When I start worrying, I cannot stop	1	2	3	4
37. Some thoughts will always need to be controlled	1	2	3	4
38. I need to worry, in order to get things done	1	2	3	4
39. I will be punished for not controlling certain thoughts	1	2	3	4
40. My thoughts interfere with my concentration	1	2	3	4
41. It is alright to let my thoughts roam free	1	2	3	4
42. I worry about my thoughts	1	2	3	4
43. I am easily distracted	1	2	3	4
44. My worrying thoughts are not productive	1	2	3	4
45. Worry can stop me from seeing a situation clearly	1	2	3	4
46. Worrying helps me to solve problems	1	2	3	4
47. I have little confidence in my memory for places	1	2	3	4
48. My worrying thoughts are uncontrollable	1	2	3	4
49. It is bad to think certain thoughts	1	2	3	4

	<i>Do not agree</i>	<i>Agree slightly</i>	<i>Agree moderately</i>	<i>Agree very much</i>
50. If I do not control my thoughts, I may end up embarrassing myself	1	2	3	4
51. I do not trust my memory	1	2	3	4
52. I do my clearest thinking when I am worrying	1	2	3	4
53. My worrying thoughts appear automatically	1	2	3	4
54. I would be selfish if I never worried	1	2	3	4
55. If I could not control my thoughts, I would not be able to function	1	2	3	4
56. I need to worry, in order to work well	1	2	3	4
57. I have little confidence in my memory for actions	1	2	3	4
58. I have difficulty keeping my mind focused on one thing for a long time	1	2	3	4
59. If a bad thing happens which I have not worried about, I feel responsible	1	2	3	4
60. It would not be normal, if I did not worry	1	2	3	4
61. I constantly examine my thoughts	1	2	3	4
62. If I stopped worrying, I would become glib, arrogant and offensive	1	2	3	4
63. Worrying helps me to plan the future more effectively	1	2	3	4
64. I would be a stronger person if I could worry less	1	2	3	4
65. I would be stupid and complacent not to worry	1	2	3	4

Please ensure that you have responded to all items. Thank you.

From Wells, 1997, with permission.

LSHS	Certainly applies to me 4	Possibly applies to me 3	Unsure 2	Possibly does not apply to me 1	Certain does not apply to me 0
1. No matter how hard I try to concentrate, unrelated thoughts always creep into my mind					
2. In my daydreams I can hear the sound of a tune almost as clearly as if I were actually listening to it					
3. Sometimes my thoughts seem as real as actual events in my life					
4. Sometimes a passing thought will seem so real that it frightens me					
5. The sounds I hear in my daydreams are generally clear and distinct					
6. The people in my daydreams seem so true to life that sometimes I think they are					
7. I often hear a voice speaking my thoughts aloud					
8. In the past, I have had the experience of hearing a person's voice and then found that no-one was there					
9. On occasions, I have seen a person's face in front of me when no-one was in fact there					
10. I have heard the voice of the Devil					
11. In the past, I have heard the voice of God speaking to me					
12. I have been troubled by hearing voices in my head					

2

PTQ

In this questionnaire, you will be asked to describe how you thought about the video clip in the past 12 minutes. Please read the following statements and rate the extent to which they applied to you while you were thinking about the contents of the video clip

		never	rarely	sometimes	often	almost always
1.	The same thoughts kept going through my mind again and again.	0	1	2	3	4
2.	Thoughts intruded into my mind.	0	1	2	3	4
3.	I couldn't stop dwelling on them.	0	1	2	3	4
6.	My thoughts repeated themselves.	0	1	2	3	4
7.	Thoughts came to my mind without me wanting them to.	0	1	2	3	4
8.	I got stuck on certain issues and couldn't move on.	0	1	2	3	4
11.	I kept thinking about the same issue all the time.	0	1	2	3	4
12.	Thoughts just popped into my mind.	0	1	2	3	4
13.	I felt driven to continue dwelling on the same issue.	0	1	2	3	4

3

Auditory Task

I want you to listen closely to a recording. There are words or phrases in this recording. Try to detect these words and phrases, and when you hear them, write them down below and indicate (by ticking the appropriate box) how distressing you found the experience.

[illegible]

Continue on next page if necessary

4


Paranoia Checklist (Summary Sheet)

Many people have thoughts, worries, or suspicions that others may be trying to upset them. It is a common experience, just as people can sometimes feel anxious or low in mood. Below are listed some of the thoughts that people report. For each one please indicate in the moment how strongly you have the thought, how strongly you believe it, and how upsetting the experience is for you, by ticking the appropriate box. I sometimes get the thought that:

	1 Not at all	2	3	4	5 Very strongly		Do not believe it	Believe it a little	Believe it somewhat	Believe it a lot	Absolutely believe it		Not distressing	A little distressing	Somewhat distressing	Moderately distressing	Very distressing
I need to be on my guard against others.																	
There might be negative comments being circulated about me.																	
People deliberately try to irritate me.																	
I might be being observed or followed.																	
People are trying to make me upset.																	
People communicate about me in subtle ways																	
Strangers and friends look at me critically.																	
People might be hostile towards me.																	

	1 Not at all	2	3	4	5 Very strongly		Do not believe it	Believe it a little	Believe it somewhat	Believe it a lot	Absolutely believe it		Not distressing	A little distressing	Somewhat distressing	Moderately distressing	Very distressing
Bad things are being said about me behind my back.																	
Someone I know has bad intentions towards me																	
I have a suspicion that someone has it in for me.																	
People would harm me if given an opportunity.																	
Someone I don't know has bad intentions towards me.																	
There is a possibility of a conspiracy against me.																	
People are laughing at me.																	
I am under threat from others.																	
I can detect coded messages about me in the press/TV/radio																	
My actions and thoughts might be controlled by others.																	

Appendix 9: Distraction presentation slides

<p><i>Reactions to stressful events</i></p>	<p>Please complete the questionnaires in the pack marked '1'</p>	<p>On the next slide, you will be shown a video clip, which will start automatically. Using the headphones provided, please ensure that you focus closely on watching and listening to the clip while it is playing; try not to look away.</p> <p>If the clip does not play automatically, please alert the researcher. When the clip has ended, click to move onto the next slide.</p>
1	2	3
	<p>You will now be shown some questions which you will be asked to focus on and think about; this task will last for 12 minutes in total. Please use the blank paper provided to note down your answers.</p> <ul style="list-style-type: none">• The slides will transition automatically• Please click next to begin	<p>List States of America that begin with the letter M or N</p>
4	5	02:00 6

<p>List London Underground stations</p> <p>02:00 7</p>	<p>List fruits and vegetables that begin with a vowel</p> <p>02:00 8</p>	<p>List European capital cities</p> <p>02:00 9</p>
<p>List planets in our solar system</p> <p>02:00 10</p>	<p>List elements from the periodic table</p> <p>02:00 11</p>	<p>Now please complete the brief questionnaire in the pack marked '2'. Please do not spend too long on these questions.</p> <p>02:00 12</p>

Please use the form in the pack marked '3' and follow the instructions.....I want you to listen closely to a recording. There are words or phrases in this recording. Try to detect these words and phrases, and when you hear them, write them down on the form and indicate (by ticking the appropriate box) how distressing you found the experience.

When you are ready to proceed, click on the icon below to begin the sound clip. When the clip has ended, click to move onto the next slide.



13

Thank you. Please now complete the questionnaire in the pack marked '4'.


14

The tasks are now finished, thank you. Please take this opportunity to ask any questions. We hope to improve our understanding of the occurrence of auditory intrusions and suspiciousness following stressful material, and whether this is related to what people do after watching the clip (i.e. think repetitively about it or distract themselves).

Experiencing auditory intrusions and suspiciousness is quite common, and does not necessarily cause any distress. The audio clip below gives more information on this- please click the icon to begin. you feel significantly distressed following these tasks, please speak to the researcher.



Appendix 10: Rumination presentation slides

<p><i>Reactions to stressful events</i></p>	<p>Please complete the questionnaires in the pack marked '1'</p>	<p>On the next slide, you will be shown a video clip, which will start automatically. Using the headphones provided, please ensure that you focus closely on watching and listening to the clip while it is playing; try not to look away.</p> <p>If the clip does not play automatically, please alert the researcher. When the clip has ended, click to move onto the next slide.</p>
1	2	3
	<p>You will now be shown some questions which you will be asked to focus on and think about; this task will last for 12 minutes in total.</p> <ul style="list-style-type: none">• First, read the sentence silently to yourself• Then think about a concern or a question the sentence might bring up for you in relation to the video clip• Dwell on the implications of the question, or drift to related issues and follow any associated thoughts• If you find yourself thinking about something completely unrelated to the task, bring your attention back to the sentences• The slides will transition automatically• Please click next to begin	<p>What if I was attacked like the couple were?</p>
4	5	6

01:00

Why do people have to be so violent?

01:00

7

How would I cope if that happened to me?

01:00

8

What if I had to deal with the effects of that situation?

01:00

Why do bad things happen to good people?

01:00

10

Why is the world such a dangerous place?

01:00

11

What if I couldn't cope afterwards?

01:00

<p>Why is the world so unpredictable?</p> <p>01:00 13</p>	<p>What if something even worse happened to me or my family one day?</p> <p>01:00 14</p>	<p>Why would people want to hurt others?</p> <p>01:00 15</p>
<p>What if I couldn't protect myself?</p> <p>01:00 16</p>	<p>Why is the world so unfair?</p> <p>01:00 17</p>	<p>Now please complete the brief questionnaire in the pack marked '2'. Please do not spend too long on these questions.</p> <p>18</p>

Please use the form in the pack marked '3' and follow the instructions.....I want you to listen closely to a recording. There are words or phrases in this recording. Try to detect these words and phrases, and when you hear them, write them down on the form and indicate (by ticking the appropriate box) how distressing you found the experience.

When you are ready to proceed, click on the icon below to begin the sound clip. When the clip has ended, click to move onto the next slide.



19

Thank you. Please now complete the questionnaire in the pack marked '4'.

20

The tasks are now finished, thank you. Please take this opportunity to ask any questions. We hope to improve our understanding of the occurrence of auditory intrusions and suspiciousness following stressful material, and whether this is related to what people do after watching the clip (i.e. think repetitively about it or distract themselves).

Experiencing auditory intrusions and suspiciousness is quite common, and does not necessarily cause any distress. The audio clip below gives more information on this- please click the icon to begin. If you feel significantly distressed following these tasks, please speak to the researcher.



21

Appendix 11: Content Coding

Coding instructions

You are being asked to code each recording (listed in one excel cell) as to whether or not it corresponds with a content code derived from the film content. The excel sheets will look like this:

Recording	Distress	Eligible word?	Code	Match?
yeah	1	0		
they	1	0		
right	1	0		
wall	1	0		
on the one hand	1	1		
serious	1	1		
resurrect	1	1		
yeah why	1	1		
music	1	1		
believe	1	1		
presume	1	1		
Average distress and total eligible	1	7		

1. Look at the recording in the top of the left hand column
2. Check it against the list of codes and examples given below- systematically go through each code and check if it matches the content of the recording. Focus on the themes foremost- the examples are there to guide the interpretation of the themes and don't include all possible content that would be given that code
3. If one of the codes matches (e.g. if the content is about a dog, code 4 or includes an expletive, code 1), list this code in the column marked 'Code'
4. If more than one code applies, add both separated by a comma
5. If no code applies, insert '0' in the Code column
6. Repeat down the list of recordings
7. Do not refer to the distress, eligibility or match columns
8. If there are any codes you are unsure of or any recordings that need clarification, make a note of these on a separate sheet
9. Store the excel sheet securely and retain the password in a safe place
10. Delete the file once the data has been returned to SH

Examples:

Code number	Code name	Example
1	Expletive/ swear	- Get the fuck over here. - A chickenhead and a faggot.
2	Getting/ taking/ keeping/ staying	- Give me your watch, give me your - Okay. Will you get me my jacket too? - I think he's a keeper. A keeper - You sit here. Okay?
3	Boy/man/man's name/human	- Here, boy. Good boy. - Come on, man - David! - So she is human.
4	Dog/ Curtis	- Give me the dog. - Where's Curtis?
5	Endearment/ liking	- Your mom is so sweet and she just... - That's the nicest thing you've ever said to me
6	Eating/ food	- I didn't say you could eat the whole thing. - Look, she gave me an apple. Here, baby.
7	Day/ time/ age	- Let's go, I ain't got all day. - I could get about maybe five days... -when you get older
8	Harm/ insult/ mean	- Are you gonna be that crabby ...? - You're hurting him! - That's what I thought, you stupid....
9	Found/ lost	- Thanks for finding him. - Where's Curtis?
10	Going away/ leaving	- Let's go. Hurry up! - Could go to the place with the water and...
11	Thanks	- Thanks - Our gratitude. Now give him to me.
12	Filming	- Action! - Hollywood! - Say "cheese"!
13	Valuables	- I haven't got much money. - I get a reward or something?
14	Family	- David, you have a family. - Your mom is so sweet and she just...
15	Marriage/ wedding/ party	- I'm not marrying your mother - ...and the band playing and the minister.
16	Love/ beauty	- Oh, God. It's so pretty out. - Oh, how cute. Lovebirds.
17	Open/closed	- Oh, I can open my own door. - Because it's closed.
18	Legality/ establishment	- Man, don't you know there's a fucking leesh law? - Why can't we go down to city hall tonight?

Appendix 12: Original proposal form

University of Manchester Clin.Psy.D

Large Scale Research Project Proposal Submission Proforma

Do not exceed the physical limits of this form - should not be double sided

Name	Samantha Hartley
Title of Project	Rumination in response to stressful material: an analogue study of the role of perseverative processing in voice-hearing
Supervisor(s)	
Academic	Tony Morrison & Lisa Wood
Clinical/Field	N/A

INTRODUCTION

Provide a brief overview of relevant existing research and any pilot work in this area.

Rumination is a type of perseverative processing, defined as 'a class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts' (Martin, Tesser and Wyer, 1996). Rumination has traditionally been associated with depression, with a wealth of evidence to suggest that it can maintain and augment depressed mood (e.g. Nolen-Hoeksema and Morrow, 1993). More generally, several negative consequences of rumination have been identified, including increased negative interpretations of events (Lyubomirsky and Nolen-Hoeksema, 1995), over-generalised negative memories (Park, Goodyer and Teasdale, 2004), attentional bias towards negative material (Donaldson, Lam and Matthews, 2007), greater levels of cognitive and behavioural avoidance (Cribb, Moulds and Carter, 2006), and increased levels of intrusions (Watkins, 2004; Lyubomirsky et al, 2003). These secondary consequences converge with key themes in the aetiology and maintenance of experiences associated with psychosis, including the importance of intrusions, attentional biases, avoidance and perseverative processing (Garety, 2001; Morrison, 2001). More recently, research has demonstrated high levels of rumination in groups experiencing psychosis (Hepworth, 2011; Hartley et al, In submission), and pointed to a role for rumination in hallucination proneness (Jones and Fernyhough, 2009). Recent research has demonstrated that rumination predicts the subsequent experience of and distress associated with both auditory hallucinations and persecutory delusions (Hartley et al, 2013), and that ruminative processing can maintain experimentally-induced paranoia (Martinelli et al, 2013).

Alongside this body of work, there is a large evidence base supporting a role for trauma in the experience of psychosis (for example, Varese, 2012; Bentall, 2012). Ruminative processing has also been cited as a maintaining factor for post-trauma symptoms (Ehring et al, 2008; Ehlers and Clark 2000), owing to its contribution to cognitive avoidance, uninhibited intrusions and strengthened negative appraisals. Given the understanding that voices often share content with past traumas (Hardy, 2005) and the suggestion that ruminative thoughts concerning the events of past traumas might be falsely interpreted as voices (Fowler, 2006), the aim of the current study is to draw these aspects of understanding together. Previous evidence has already indicated that levels of rumination in response to stressful material are linked to more intrusive memories (Zetsche 2009; Laposa and Rector, 2012) but it has not yet been discerned whether this extends to voice hearing type experiences given the provision of anomalous audio material (Feelgood and Rantzen, 1994) and pre-existing beliefs that are a key part of cognitive models of psychosis (Morrison, 2001).

If ruminative processing is related to post-stress intrusions and psychosis-like experiences, potential clinical implications include fostering more adaptive processing styles, especially in those with experience of trauma. These might involve detached mindfulness (Wells, 2005), ACT-based approaches (Hayes, Strosahl, & Wilson, 1999) or modifying beliefs around the perceived utility of rumination (Papageorgiou and Wells, 2004).

AIMS & HYPOTHESES

State the principal aims of the research, hypotheses to be tested, and also subsidiary hypotheses or questions to be investigated.

The principal aim of the study is to investigate whether experimentally induced rumination following exposure to stressful video material is related to pseudo voice-hearing experiences and the distress associated with these. It is hypothesised that adopting a ruminative processing strategy (as compared to distraction) will result in:

1. a greater number of voice-hearing type experiences in the post-film task
2. greater distress associated with voice-hearing type experiences in the post-film task

It is also predicted that these links will be moderated by levels of metacognitive beliefs such that higher scores strengthen the relationship.

Secondary aims/ hypotheses: Rumination (compared to distraction) will result in greater:

3. state-paranoia
4. intrusions and psychotic-like experiences in the week following the manipulation.
5. We will also explore the qualitative content of the intrusions and discern whether this converges with the nature of the video material.

METHOD

EXPERIMENTAL DESIGN

Provide an outline of the design to be used (e.g. correlational, group comparison etc.)

The primary hypotheses (1&2) will be tested using a group comparison design:

Independent variable (IV): Group (two levels: rumination/ distraction condition)

Dependent variables (DV; continuous): Frequency of pseudo-voices and level of distress.

Secondary investigations will be conducted as follows:

- The primary research question (hypotheses 1&2) will also be assessed using a correlational design (relationship between level of state rumination and frequency of pseudo-hallucinations/ level of distress)
- Moderation analysis will use a multiple regression model and the procedures described by Frazier et al (2004)
- The effect of rumination on state paranoia (3) and frequency of experiences in the follow-up period (4) will be assessed using a group comparison design (IV as above, DVs as continuous measures of state paranoia, frequency and distress scales)
- Qualitative evaluation of the nature of the intrusions (5) will utilise content analysis (Krippendorff, 1984).

The design will allow for the inclusion of covariates (e.g. gender, trait levels of rumination, hallucination proneness) if these are found to be significant in univariate analyses.

PARTICIPANTS

Describe the types of participants (e.g., patient groups, students, age and sex ratios if appropriate and methods of recruitment).

Recruitment of an analogue sample of university students will proceed in an opportunistic fashion. Inclusion criteria: English-speaking; 18 years old or above; normal/ corrected vision and hearing. Potential participants will be excluded if they have a history of/ current contact with secondary care psychiatric services or experience of physical assault. Criteria will be assessed by a self-report screening tool. Recruitment materials will explicitly state the nature of the study and inclusion of stressful video material. Participants will be offered a psychology career-themed seminar or entry into a raffle to receive one of two £50 gift vouchers, as a token of appreciation.

POWER CALCULATION/EXPECTED NUMBER OF PARTICIPANTS

NB This section must be completed in conjunction with a statistician to satisfy COREC requirements

Given a simple group mean comparison and medium (~0.56) effect size, a sample of 51 participants in each group (102 total) would have above 80% power to detect an effect with alpha level of 0.05. N.B. The above has been confirmed by the course statistical consultant, Dr. Julie Morris.

MEASURES

Describe the measures that will be used in the study and any training that is required to use them.

Pseudo voice-hearing: Ambiguous auditory stimuli paradigm (Feelgood and Rantzen, 1994)

Manipulation check: Perseverative Thinking Questionnaire-State Version (Ehring, 2007)

State paranoia: State-adapted paranoia checklist (Freeman 2005; Westermann et al 2012)

Trait rumination: Ruminative Responses Scale (Nolen-Hoeksema 1991, excluding depressive symptom items- c.f. Treynor, 2003)

Previous trauma: The Trauma History Screen (Carlson 2011)

Metacognitive beliefs: Metacognitions Questionnaire (MCQ: Cartwright-Hatton and Wells 1997); total score and subscales 'uncontrollability and danger' and 'need to control thought'

Hallucination proneness: Launay-Slade Hallucination Scale (LSHS; Bentall and Slade, 1985)

PROCEDURE

Describe the study's practical procedure.

1. Screening, written consent and baseline measures: LSHS, trait rumination, MCQ
2. Randomisation: allocation to either rumination or distraction condition
3. Video material: presentation of a 4 min 33 second clip from 'The Brave One'- an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple
4. Manipulation: Use of written prompts to induce abstract rumination on the film content/ general knowledge questions to induce distraction (c.f. Zetsche 2009)
5. Manipulation check: Perseverative thinking questionnaire
6. Voice-hearing task: Presentation of a clip of a human voice recording, which has been spliced into 1 second clips, randomised and played backwards.
7. Measure of state paranoia
8. Diary of intrusions: participants will record intrusions in an event-contingent manner and answer daily items on psychosis-like experiences for 7 days after the initial experimental session.

An effort will be made to conduct the experimental phase en masse to efficiently use resources. Presentation of the materials will be standardised using Powerpoint.

Debriefing: Similar, prior research within the PTSD literature has not reported any adverse effects, although robust procedures around debriefing will be implemented. Participant information sheets will include signposting to local services- University Student Services, NHS 111, the Samaritans, and Student Services will be informed of the study prior to commencement. The researcher will check distress at the end of experimental session and the diary booklet will include signposting for possible distress. When participants return the diary booklet, the researcher will again check distress and also provide normalising information around psychosis-like experiences. With regard to the disclosure of specific trauma, participants will be signposted to their GP to access services if appropriate.

STATISTICAL ANALYSIS

Provide an outline of the statistical procedures to be used in data analysis.

The data will first be inspected for normality in terms of skewness and kurtosis scores, and visual inspection of the distribution. If the data is non-normally distributed, a suitable transformation will be performed and if this does not remedy the situation then a non-parametric test will be used (e.g. Mann-Whitney U test).

Assuming a normal distribution, a group mean comparison will be conducted using an independent samples t-test, with group (rumination versus distraction) as the independent variable and frequency/ distress of pseudo-psychosis experiences as the dependent variable (continuous). Moderation analysis will use multiple regression and the procedure outlined by Frazier et al (2004). If significant confounding variables are identified (as a result of inspecting the relationships between trait rumination/hallucination proneness and psychosis experiences/ differences between genders in terms of psychosis experiences), then these will be incorporated into the analysis using an Analysis of Covariance (ANCOVA) design or hierarchical multiple regression.

PATIENT AND PUBLIC INVOLVEMENT (PPI)

Describe the potential utility and benefit of the proposed research project to service users and their supporters. If you have any discussion or consultation with service users, please describe it in this section.

The current study will not directly offer any patient benefit, although the results will feed into understanding of the aetiology of experiences associated with psychosis and possible intervention strategies. Although the sample will be an analogue one, there is a wealth of evidence to suggest that psychosis experiences exist on a continuum (e.g. Verdoux and van Os, 2002), and so findings can extend into the clinical field. As stated above, future intervention strategies might involve mindfulness-based approaches, or working on beliefs about rumination, which may support its use as a processing strategy outside the experimental manipulation.

The preliminary study design and objectives were presented and positively received at the recent Psychosis Research Unit conference, which brings together researchers, service users and clinicians to review planned or completed research.

The Community Liaison Group have also been consulted regarding the project design and implementation, and made the following suggestions:

- Make the links with future possible patient benefit explicit (as above) and to be explicit about dissemination plans (see below)
- Inform Student Services about the study in advance (as outlined in *Procedures*)
- Include signposting to services in the diary booklet (as outlined in *Procedures*)
- Screen out those who might be at most 'risk' of adverse effects (which will be implemented via the exclusion of those with a history of/ current contact with secondary care services and previous similar trauma- as outlined in *Participants*)

COSTS

Estimate the research costs (e.g., cost of tests/measures, travel, photocopying etc.)

- Photocopying of measures: £10
 - Two £50 vouchers: £100
 - Colour printing of dissemination newsletter (quote from university Graphics Support Workshop): 25p per page – 2 page newsletter x 120 copies= £60
 - Presentation at the BABCP2015 summer conference: £175 registration, £50 travel
- Total= £395

QUESTIONS FOR THE COMMITTEE

List any questions that you would like the committee to advise on.

- As part of the distress-monitoring procedures (and as implemented by established research groups), a phone call to participants could be made within 24 hours of the experimental phase. This would allow the researcher to check for any distress and signpost where appropriate. However, this might also adversely affect the validity of the post-manipulation diary phase (for example, by prompting intrusions). We would welcome the committee's thoughts on this.
- Is the committee aware of any objective measures of state paranoia, which are quick to administer and could be used in place of the self-report tool currently included?

DIFFICULTIES *Please include a list of the difficulties that this research presents you with. Include practical pitfalls, ethical issues, and potential confounds.*

- There are potential ethical issues surrounding the use of stressful video material, use of a manipulation and voice-hearing task. Numerous procedures have been put in place to counteract the possibility of distress. In addition, the video material chosen is freely available, certificate 18 and so hopefully does not constitute inappropriate or extreme footage. We also intend to pilot the methods prior to recruitment. Rumination is a processing strategy that many people engage in and it is unlikely that doing so as part of the experimental phase will have long-term effects.

There are numerous potential confounds of the statistical relationship under scrutiny. Although the limitations of statistical power do not permit us to include all of these, some key variables based on prior research will be controlled for in secondary analyses, such as trait rumination and gender.

KEY REFERENCES

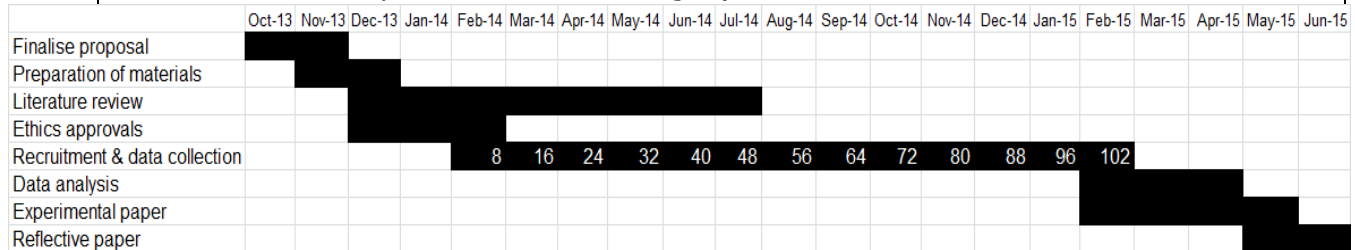
NB Please see additional sheet for full list of references.

- Ehring, T., Frank, S., & Ehlers, A. (2008). The role of rumination and reduced concreteness in the maintenance of posttraumatic stress disorder and depression following trauma. *Cognitive therapy and research*, 32(4), 488-506.
- Feelgood, S. R., & Rantzen, A. J. (1994). Auditory and visual hallucinations in university students. *Personality and Individual Differences*, 17(2), 293-296.
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- Hepworth, C., Startup, H., & Freeman, D. (2011). Developing treatments of persistent persecutory delusions: The impact of an emotional processing and metacognitive awareness intervention. *The Journal of nervous and mental disease*, 199(9), 653-658.
- Jones, S. R., & Fernyhough, C. (2009). Rumination, reflection, intrusive thoughts, and hallucination-proneness: towards a new model. *Behaviour research and therapy*, 47(1), 54-59.
- Laposa, J. M., & Rector, N. A. (2012). The prediction of intrusions following an analogue traumatic event: Peritraumatic cognitive processes and anxiety-focused rumination versus rumination in response to intrusions. *Journal of behavior therapy and experimental psychiatry*, 43(3), 877-883
- Zetsche, U., Ehring, T., & Ehlers, A. (2009). The effects of rumination on mood and intrusive memories after exposure to traumatic material: An experimental study. *Journal of behavior therapy and experimental psychiatry*, 40(4), 499-514.

TIME BUDGET

Plan showing how time is accounted for.

Please see the GANNT chart below depicting the main research components (with recruitment depicted as cumulative targets).



Dissemination of the main findings will be conducted following thesis hand-in, and will involve a newsletter to participants, presentation to the Psychosis Research Unit Quarterly conference, submission to peer reviewed journals, dissemination via local networks (e.g. the Mental Health Research Network, Hearing Voices Network) and presentation at a national conference, where possible.

BRIEF SUMMARY OF PROPOSAL IN LAY TERMS (200-300 WORDS)

Prior research has shown that the way with think about stressful events can impact on the distress we feel afterwards, and how often thoughts about the event come into our mind. We also know that people who experience psychosis (hear or see things that other people don't, or have distressing beliefs) tend to think about things in a different way from those who don't experience psychosis.

Our idea is to investigate the impact of a particular way of thinking on people's experiences in reaction to stressful material. This will involve asking participants (students) to watch a stressful film (a method that has been used a lot in previous research) and then distract themselves (complete a quiz) or 'ruminate' about the film (think about it repetitively in an abstract way). After this, participants will listen to an audio recording of jumbled-up human voice sounds and asked if they can make out any words. This task is intended to assess voice-hearing type experiences similar to those in psychosis.

Our prediction is that if people watch the film and then ruminate about it, they will be more likely to have voice-hearing type experiences, especially if they think unexpected thoughts are dangerous or need to be controlled. We will also give people a diary to record any experiences they have in the week following the video and audio task.

We hope that the results of our study will help us to understand more about how distressing experiences develop after stressful events. In the future, this might assist with the development of specific ways to help people respond in different, more helpful ways and reduce the frequency and impact of these experiences.

CONTINGENCY PLAN

- Recruitment contingency: Recruitment will be reviewed against the GANNT chart above during every supervision session. If recruitment falls below 50% of expected after 3 months, then alternative possible recruitment sources/ advertising (such as staff groups or psychology seminar involving presentation of the study) will be explored and subsequently implemented at the 4 month stage
- Statistical contingency: At the analysis stage, if the experimental manipulation is not effective in producing a between-group difference in level of rumination, secondary correlational analysis will still offer a method of assessing a relationship between the level of state rumination and frequency of/ distress associated with psychosis-like intrusions

SUBMISSION FORMAT

The ClinPsyD's preferred submission option for all theses is the paper-based format. If you and your supervisor feel that your thesis would be best submitted in the chapter-based format, please give more details here:

- ✓ It is anticipated that multiple papers will be produced from the research
- () The research uses particularly novel and/or complex methodologies which may require more comprehensive exposition
- () Other (please explain):

Appendix 13: Revised proposal form

University of Manchester Clin.Psy.D

Large Scale Research Project

Proposal Submission Proforma

Do not exceed the physical limits of this form - should not be double sided

Name	Samantha Hartley
Title of Project	Rumination in response to stressful material: an analogue study of the role of perseverative processing in voice-hearing
Supervisor(s)	
Academic	Tony Morrison & Lisa Wood
Clinical/Field	N/A

INTRODUCTION

Provide a brief overview of relevant existing research and any pilot work in this area.

Rumination is a type of perseverative processing, defined as 'a class of conscious thoughts that revolve around a common instrumental theme and recur in the absence of immediate environmental demands requiring the thoughts' (Martin, Tesser and Wyer, 1996). Rumination has traditionally been associated with depression, with a wealth of evidence to suggest that it can maintain and augment depressed mood (e.g. Nolen-Hoeksema and Morrow, 1993). More generally, several negative consequences of rumination have been identified, including increased negative interpretations of events (Lyubomirsky and Nolen-Hoeksema, 1995), over-generalised negative memories (Park, Goodyer and Teasdale, 2004), attentional bias towards negative material (Donaldson, Lam and Matthews, 2007), greater levels of cognitive and behavioural avoidance (Cribb, Moulds and Carter, 2006), and increased levels of intrusions (Watkins, 2004; Lyubomirsky et al, 2003). These secondary consequences converge with key themes in the aetiology and maintenance of experiences associated with psychosis, including the importance of intrusions, attentional biases, avoidance and perseverative processing (Garety, 2001; Morrison, 2001). More recently, research has demonstrated high levels of rumination in groups experiencing psychosis (Hepworth, 2011; Hartley et al, In submission), and pointed to a role for rumination in hallucination proneness (Jones and Fernyhough, 2009). Recent research has demonstrated that rumination predicts the subsequent experience of and distress associated with both auditory hallucinations and persecutory delusions (Hartley et al, 2013), and that ruminative processing can maintain experimentally-induced paranoia (Martinelli et al, 2013).

Alongside this body of work, there is a large evidence base supporting a role for trauma in the experience of psychosis (for example, Varese, 2012; Bentall, 2012). Ruminative processing has also been cited as a maintaining factor for post-trauma symptoms (Ehring et al, 2008; Ehlers and Clark 2000), owing to its contribution to cognitive avoidance, uninhibited intrusions and strengthened negative appraisals. Given the understanding that voices often share content with past traumas (Hardy, 2005) and the suggestion that ruminative thoughts concerning the events of past traumas might be falsely interpreted as voices (Fowler, 2006), the aim of the current study is to draw these aspects of understanding together. Previous evidence has already indicated that levels of rumination in response to stressful material are linked to more intrusive memories (Zetsche 2009; Laposa and Rector, 2012) but it has not yet been discerned whether this extends to voice hearing type experiences given the provision of anomalous audio material (Feelgood and Rantzen, 1994) and pre-existing beliefs that are a key part of cognitive models of psychosis (Morrison, 2001).

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AIMS & HYPOTHESES

State the principal aims of the research, hypotheses to be tested, and also subsidiary hypotheses or questions to be investigated.

The principal aim of the study is to investigate whether experimentally induced rumination following exposure to stressful video material is related to pseudo voice-hearing experiences and the distress associated with these. It is hypothesised that adopting a ruminative processing strategy (as compared to distraction) will result in:

6. a greater number of voice-hearing type experiences in the post-film task
7. greater distress associated with voice-hearing type experiences in the post-film task

It is also predicted that these links will be moderated by levels of metacognitive beliefs such that higher scores strengthen the relationship.

Secondary aims/ hypotheses: Rumination (compared to distraction) will result in greater:

8. state-paranoia
9. intrusions and psychotic-like experiences in the week following the manipulation.
10. We will also explore the qualitative content of the intrusions and discern whether this converges with the nature of the video material.

METHOD

EXPERIMENTAL DESIGN

Provide an outline of the design to be used (e.g. correlational, group comparison etc.)

The primary hypotheses (1&2) will be tested using a group comparison design:

Independent variable (IV): Group (two levels: rumination/ distraction condition)

Dependent variables (DV; continuous): Frequency of pseudo-voices and level of distress.

Secondary investigations will be conducted as follows:

- The primary research question (hypotheses 1&2) will also be assessed using a correlational design (relationship between level of state rumination and frequency of pseudo-hallucinations/ level of distress)
- Moderation analysis will use a multiple regression model and the procedures described by Frazier et al (2004)
- The effect of rumination on state paranoia (3) and frequency of experiences in the follow-up period (4) will be assessed using a group comparison design (IV as above, DVs as continuous measures of state paranoia, frequency and distress scales)
- Qualitative evaluation of the nature of the intrusions (5) will utilise content analysis (Krippendorff, 1984).

The design will allow for the inclusion of covariates (e.g. gender, trait levels of rumination, hallucination proneness) if these are found to be significant in univariate analyses.

PARTICIPANTS

Describe the types of participants (e.g., patient groups, students, age and sex ratios if appropriate and methods of recruitment).

Recruitment of an analogue sample of university students will proceed in an opportunistic fashion. Inclusion criteria: English-speaking; 18 years old or above; normal/ corrected vision and hearing. Potential participants will be excluded if they have a history of/ current contact with secondary care psychiatric services or experience of physical assault. Criteria will be assessed by a self-report screening tool. Recruitment materials will explicitly state the nature of the study and inclusion of stressful video material. Participants will be offered a psychology career-themed seminar or entry into a raffle to receive one of two £50 gift vouchers, as a token of appreciation.

POWER CALCULATION/EXPECTED NUMBER OF PARTICIPANTS

NB This section must be completed in conjunction with a statistician to satisfy COREC requirements

Given a simple group mean comparison and medium (~ 0.56) effect size, a sample of 51 participants in each group (102 total) would have above 80% power to detect an effect with alpha level of 0.05.

N.B. The above has been confirmed by the course statistical consultant, Dr. Julie Morris.

MEASURES

Describe the measures that will be used in the study and any training that is required to use them.

Pseudo voice-hearing: Ambiguous auditory stimuli paradigm (Feelgood and Rantzen, 1994)

Manipulation check: Perseverative Thinking Questionnaire-State Version (Ehring, 2007)

State paranoia: State-adapted paranoia checklist (Freeman 2005; Westermann et al 2012)

Trait rumination: Ruminative Responses Scale (Nolen-Hoeksema 1991, excluding depressive symptom items- c.f. Treynor, 2003)

Previous trauma: The Trauma History Screen (Carlson 2011)

Metacognitive beliefs: Metacognitions Questionnaire (MCQ: Cartwright-Hatton and Wells 1997); total score and subscales 'uncontrollability and danger' and 'need to control thought'

Hallucination proneness: Launay-Slade Hallucination Scale (LSHS; Bentall and Slade, 1985)

PROCEDURE

Describe the study's practical procedure.

9. Screening, written consent and baseline measures: LSHS, trait rumination, MCQ
10. Randomisation: allocation to either rumination or distraction condition
11. Video material: presentation of a 4 min 33 second clip from 'The Brave One' - an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple
12. Manipulation: Use of written prompts to induce abstract rumination on the film content/ general knowledge questions to induce distraction (c.f. Zetsche 2009)
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14. Voice-hearing task: Presentation of a clip of a human voice recording, which has been spliced into 1 second clips, randomised and played backwards.
15. Measure of state paranoia
16. Diary of intrusions: participants will record intrusions in an event-contingent manner and answer daily items on psychosis-like experiences for 7 days after the initial experimental session.

An effort will be made to conduct the experimental phase en masse to efficiently use resources. Presentation of the materials will be standardised using Powerpoint.

Debriefing: Similar, prior research within the PTSD literature has not reported any adverse effects, although robust procedures around debriefing will be implemented. Participant information sheets will include signposting to local services- University Student Services, NHS 111, the Samaritans, and Student Services will be informed of the study prior to commencement. The researcher will check distress at the end of experimental session and the diary booklet will include signposting for possible distress. When participants return the diary booklet, the researcher will again check distress and also provide normalising information around psychosis-like experiences. With regard to the disclosure of specific trauma, participants will be signposted to their GP to access services if appropriate.

STATISTICAL ANALYSIS

Provide an outline of the statistical procedures to be used in data analysis.

The data will first be inspected for normality in terms of skewness and kurtosis scores, and visual inspection of the distribution. If the data is non-normally distributed, a suitable transformation will be performed and if this does not remedy the situation then a non-parametric test will be used (e.g. Mann-Whitney U test).

Assuming a normal distribution, a group mean comparison will be conducted using an independent samples t-test, with group (rumination versus distraction) as the independent variable and frequency/ distress of pseudo-psychosis experiences as the dependent variable (continuous). Moderation analysis will use multiple regression and the procedure outlined by Frazier et al (2004).

If significant confounding variables are identified (as a result of inspecting the relationships between trait rumination/hallucination proneness and psychosis experiences/ differences between genders in terms of psychosis experiences), then these will be incorporated into the analysis using an Analysis of Covariance (ANCOVA) design or hierarchical multiple regression.

PATIENT AND PUBLIC INVOLVEMENT (PPI)

Describe the potential utility and benefit of the proposed research project to service users and their supporters. If you have any discussion or consultation with service users, please describe it in this section.

The current study will not directly offer any patient benefit, although the results will feed into understanding of the aetiology of experiences associated with psychosis and possible intervention strategies. Although the sample will be an analogue one, there is a wealth of evidence to suggest that psychosis experiences exist on a continuum (e.g. Verdoux and van Os, 2002), and so findings can extend into the clinical field. As stated above, future intervention strategies might involve mindfulness-based approaches, or working on beliefs about rumination, which may support its use as a processing strategy outside the experimental manipulation.

The preliminary study design and objectives were presented and positively received at the recent Psychosis Research Unit conference, which brings together researchers, service users and clinicians to review planned or completed research.

The Community Liaison Group have also been consulted regarding the project design and implementation, and made the following suggestions:

- Make the links with future possible patient benefit explicit (as above) and to be explicit about dissemination plans (see below)
- Inform Student Services about the study in advance (as outlined in *Procedures*)
- Include signposting to services in the diary booklet (as outlined in *Procedures*)
- Screen out those who might be at most 'risk' of adverse effects (which will be implemented via the exclusion of those with a history of/ current contact with secondary care services and previous similar trauma- as outlined in *Participants*)

COSTS

Estimate the research costs (e.g., cost of tests/measures, travel, photocopying etc.)

- Photocopying of measures: £10
 - Two £50 vouchers: £100
 - Colour printing of dissemination newsletter (quote from university Graphics Support Workshop): 25p per page – 2 page newsletter x 120 copies= £60
 - Presentation at the BABCP2015 summer conference: £175 registration, £50 travel
- Total= £395

QUESTIONS FOR THE COMMITTEE

List any questions that you would like the committee to advise on.

- As part of the distress-monitoring procedures (and as implemented by established research groups), a phone call to participants could be made within 24 hours of the experimental phase. This would allow the researcher to check for any distress and signpost where appropriate. However, this might also adversely affect the validity of the post-manipulation diary phase (for example, by prompting intrusions). We would welcome the committee's thoughts on this.
- Is the committee aware of any objective measures of state paranoia, which are quick to administer and could be used in place of the self-report tool currently included?

DIFFICULTIES

Please include a list of the difficulties that this research presents you with. Include practical pitfalls, ethical issues, and potential confounds.

- There are potential ethical issues surrounding the use of stressful video material, use of a manipulation and voice-hearing task. Numerous procedures have been put in place to counteract the possibility of distress. In addition, the video material chosen is freely available, certificate 18 and so hopefully does not constitute inappropriate or extreme footage. We also intend to pilot the methods prior to recruitment. Rumination is a processing strategy that many people engage in and it is unlikely that doing so as part of the experimental phase will have long-term effects.
- There are numerous potential confounds of the statistical relationship under scrutiny. Although the limitations of statistical power do not permit us to include all of these, some key variables based on prior research will be controlled for in secondary analyses, such as trait rumination and gender.

KEY REFERENCES

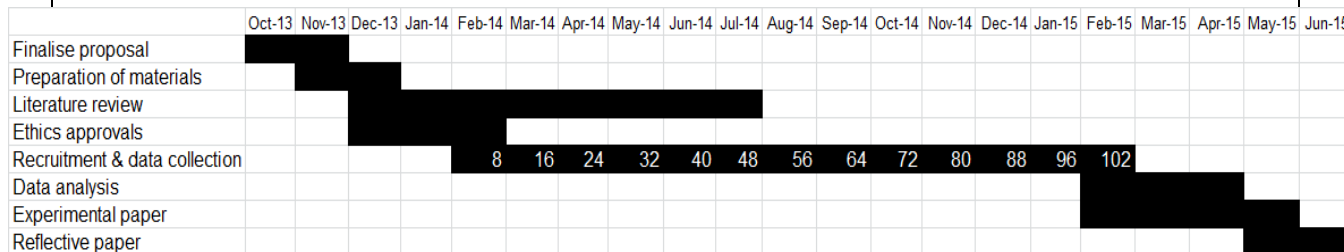
NB Please see additional sheet for full list of references.

- Ehring, T., Frank, S., & Ehlers, A. (2008). The role of rumination and reduced concreteness in the maintenance of posttraumatic stress disorder and depression following trauma. *Cognitive therapy and research*, 32(4), 488-506.
- Feelgood, S. R., & Rantzen, A. J. (1994). Auditory and visual hallucinations in university students. *Personality and Individual Differences*, 17(2), 293-296.
- Fowler, D., Freeman, D., Steel, C., Hardy, A., Smith, B., Hackman, C., & Kuipers, E. (2006). The catastrophic interaction hypothesis: how do stress, trauma, emotion and information processing abnormalities lead to psychosis? In W. Larkin & A. P. Morrison (Eds.), *Trauma and psychosis: New directions for theory and therapy* (pp. 101-124). London: Routledge.
- Hepworth, C., Startup, H., & Freeman, D. (2011). Developing treatments of persistent persecutory delusions: The impact of an emotional processing and metacognitive awareness intervention. *The Journal of nervous and mental disease*, 199(9), 653-658.
- Jones, S. R., & Fernyhough, C. (2009). Rumination, reflection, intrusive thoughts, and hallucination-proneness: towards a new model. *Behaviour research and therapy*, 47(1), 54-59.
- Laposa, J. M., & Rector, N. A. (2012). The prediction of intrusions following an analogue traumatic event: Peritraumatic cognitive processes and anxiety-focused rumination versus rumination in response to intrusions. *Journal of behavior therapy and experimental psychiatry*, 43(3), 877-883.
- Zetsche, U., Ehring, T., & Ehlers, A. (2009). The effects of rumination on mood and intrusive memories after exposure to traumatic material: An experimental study. *Journal of behavior therapy and experimental psychiatry*, 40(4), 499-514.

TIME BUDGET

Plan showing how time is accounted for.

Please see the GANNT chart below depicting the main research components (with recruitment depicted as cumulative targets).



Dissemination of the main findings will be conducted following thesis hand-in, and will involve a newsletter to participants, presentation to the Psychosis Research Unit Quarterly conference, submission to peer reviewed journals, dissemination via local networks (e.g. the Mental Health Research Network, Hearing Voices Network) and presentation at a national conference, where possible.

BRIEF SUMMARY OF PROPOSAL IN LAY TERMS (200-300 WORDS)

Prior research has shown that the way with think about stressful events can impact on the distress we feel afterwards, and how often thoughts about the event come into our mind. We also know that people who experience psychosis (hear or see things that other people don't, or have distressing beliefs) tend to think about things in a different way from those who don't experience psychosis.

Our idea is to investigate the impact of a particular way of thinking on people's experiences in reaction to stressful material. This will involve asking participants (students) to watch a stressful film (a method that has been used a lot in previous research) and then distract themselves (complete a quiz) or 'ruminate' about the film (think about it repetitively in an abstract way). After this, participants will listen to an audio recording of jumbled-up human voice sounds and asked if they can make out any words. This task is intended to assess voice-hearing type experiences similar to those in psychosis.

Our prediction is that if people watch the film and then ruminate about it, they will be more likely to have voice-hearing type experiences, especially if they think unexpected thoughts are dangerous or need to be controlled. We will also give people a diary to record any experiences they have in the week following the video and audio task.

We hope that the results of our study will help us to understand more about how distressing experiences develop after stressful events. In the future, this might assist with the development of specific ways to help people respond in different, more helpful ways and reduce the frequency and impact of these experiences.

CONTINGENCY PLAN

- Recruitment contingency: Recruitment will be reviewed against the GANNT chart above during every supervision session. If recruitment falls below 50% of expected after 3 months, then alternative possible recruitment sources/ advertising (such as staff groups or psychology seminar involving presentation of the study) will be explored and subsequently implemented at the 4 month stage
- Statistical contingency: At the analysis stage, if the experimental manipulation is not effective in producing a between-group difference in level of rumination, secondary correlational analysis will still offer a method of assessing a relationship between the level of state rumination and frequency of/ distress associated with psychosis-like intrusions

SUBMISSION FORMAT

The ClinPsyD's preferred submission option for all theses is the paper-based format. If you and your supervisor feel that your thesis would be best submitted in the chapter-based format, please give more details here:

- ✓ It is anticipated that multiple papers will be produced from the research
- () The research uses particularly novel and/or complex methodologies which may require more comprehensive exposition
- () Other (please explain):

Appendix 14: Response letter

Wednesday, 06 November 2013

Dear Members of the Research Sub-Committee Panel,

Thank you for your thorough consideration of our proposal and your detailed feedback and suggestions. I have responded to each point below (responses in italics) and changes are highlighted in the proposal document (underlined).

- It is a requirement to have a second academic supervisor from the School of Psychological Sciences, please discuss this further with your primary supervisor to help you identify one.

Dr Sandra Bucci has agreed to fulfil the role of an additional supervisor for the project.

- Revise your introduction to include the 2006 model by Walters and clarify if you mean mindfulness based approaches rather than ACT.

This paper has now been cited in the proposal, and further exploration of the ideas presented will be included in the thesis introduction.

'...including the importance of intrusions, attentional biases, avoidance, perseverative processing and contextualised memories (Garety, 2001; Morrison, 2001; Walters, 2006)'

'.....mindfulness ACT-based approaches (Hayes, Strosahl, & Wilson, 1999)'

- Clarify the theoretical and procedural link between watching a distressing video and hearing a voice (as much as possible).

As far as possible, this has been expanded in the proposal form and more detailed discussion will be included in the thesis introduction.

'...the aim of the current study is explore whether, following distressing material, ruminative processing leads to increased pseudo voice-hearing, given the provision of anomalous auditory material.'

- Revise your design and include individuals that score high and low on a hallucination proneness measure. This 2x2 design would require you to provide a revised power calculation and recruitment procedure. Provide information on how many people you will need to screen to obtain your sample and consider attrition, how many you plan to recruit initially.

Following this suggestion, we consulted with programme statistician, Julie Morris. Julie has advised us that it would be appropriate for us to include a categorical variable for high vs. low hallucination proneness, and that this could be derived from a median split of the continuous measure, which would have minimal impact on recruitment strategies and ensure balanced groups. This is now reflected in the statistical analyses section of the proposal:

'Hallucination proneness will be converted into a dichotomous categorical variable (high vs. low) via the use of a median split, ensuring equal groups.'

- Clarify how long it will take to complete all the measures.
 - Screening: 10 minutes
 - Video material: 5 minutes
 - Manipulation: 12 minutes
 - Voice-hearing task: 5 minutes
 - Measure of state paranoia: 5 minutesTotal: 37 minutes
- Provide information on how different the tasks in each condition are.
 - Both 12 minutes long (see Zetsche 2009)
 - Rumination: prompted by abstract questions on the screen, participants asked to think about 'why do people get attacked like this' 'how would I cope if that happened to me'
 - Distraction: Participants prompted to think of answers to a general knowledge question unrelated to the film content, e.g. 'recall as many US presidents as you can think of'

Details of this have now been added to the proposal:

'Use of written prompts to induce abstract rumination on the film content (e.g. 'why do attacks like this happen')/ general knowledge questions unrelated to the film content to induce distraction (c.f. Zetsche 2009)'

- Ask participants if they had already seen the film you propose to use.

This has now been included in the proposal:

'Potential participants will be excluded if they have seen the video footage previously.'

- Carry out a pilot study to establish if the film clip has the desired effect.

This is being conducted with informal contacts of the trainee.

- Is the diary measure necessary? How can its completion be facilitated?

Having reflected on the committee's advice regarding this issue and revisited the literature, we have decided to remove the diary component from the study. This is based on the understanding that participants are unlikely to record psychotic-like experiences (such as pseudo-voices) without the provision of anomalous audio material and during an extended assessment period. Previous studies have already measured the impact of rumination on subsequent intrusions; therefore analyses of this kind would not add anything novel, despite a notable amount of effort required from trainee and participants to facilitate a diary phase. Moreover, other authors have reported on the relatively low number of intrusions during this extended assessment period, and variable compliance rates (Zetchse, 2009; Laposa, 2012; Holmes and Steel 2004; Ball, 2012). References to the diary component have therefore been removed from the proposal.

- Consider offering a phone call after a week as part of your distress protocol rather than within 24 hours but provide information on where to get help as part of the distress protocol.

As noted above, the diary phase has been removed. Participants will be debriefed immediately after the experimental phase and provided with normalising information regarding psychotic-like experiences. Participants who report distress will be signposted and a follow up phone call will be made within 24 hours.

Thank you again for raising these issues and I hope this letter has clarified the information and, where necessary, improved the design.

Yours sincerely,

Samantha Hartley.

Appendix 15: Research approval email

From: Tracey Hepburn
Sent: 19 December 2013 15:08
To: Samantha Hartley
Cc: Anthony Morrison; Sandra Bucci; Lara Bennett
Subject: LSRP

Dear Sam

Thank you for your revised research proposal which was considered by Chair's Action, who was satisfied that the revisions made were appropriate and in accordance with the feedback from the meeting of 18th November 2013 and you may now proceed with your research as set out in your revised proposal.

For the purposes of ethical scrutiny by relevant NHS and/or University bodies, this letter may be taken as confirmation that your research proposal has been independently reviewed and that it is considered to meet necessary scientific and methodological standards.

On behalf of the Research Subcommittee, we wish you good luck with your research work.

Yours sincerely

Dr Dougal Julian Hare
Research Director
Chair of Research Sub-Committee (Panel A)

Tracey Hepburn

ClinPsyD Secretary

Section for Clinical and Health Psychology , 2nd Floor, Zochonis Building, University of Manchester, Oxford Road, Manchester, M13 9PL

Tel: 0161 306 0404

Appendix 16: Ethics application form

UNIVERSITY OF MANCHESTER

COMMITTEES ON THE ETHICS OF RESEARCH ON HUMAN BEINGS

Application form for ethical approval of a research project

This form should be completed by the Principal Investigator(s), after reading the guidance notes

Please note: The ethical review will be conducted by committee members who will not necessarily be familiar with your academic discipline. The form must therefore be completed in **plain, jargon-free English**

Completed applications **must be signed off by or on behalf of the Head of School.** Once signed off, the application and supporting documents should be submitted to room 2.004, John Owens building, and an electronic version of this form and all relevant attachments should be emailed to research.ethics@manchester.ac.uk, preferably in a single pdf file containing all supplementary documents. Please ensure that all relevant attachments (including questionnaires, consent forms, participant information sheets etc) are submitted as your application will not be otherwise considered complete and your application will be delayed.

Subject to workload, a project will be considered at the meeting which occurs no less than three weeks after the receipt of a fully completed application. An applicant may ask for a project to be reviewed by a specific committee. Details about the dates of all committee meetings may be obtained from the Research Ethics Office.

SECTION A – Administrative information

1. Title of the research:

Rumination in response to stressful material: an analogue study of the role of perseverative processing in voice-hearing

2. Investigator(s) (nb. In the case of postgraduate student applications the supervisor is always the joint investigator):

	Student	Supervisor/Staff
Title	Dr	Professor
Surname	Hartley	Morrison
First name	Samantha	Tony
Post		Professor of Clinical Psychology
Qualifications	PhD Clinical Psychology, BA, MA Oxon Experimental Psychology	PhD, DClinPsy Clinical Psychology
School/Unit	School of Psychological Sciences	School of Psychological Sciences
Contact Address	2 nd Floor, Zochonis Building, University of Manchester, Brunswick street, M13 9PL	
Email address	samantha.hartley@manchester.ac.uk	tonymorrison@ntlworld.com
Telephone		

3. School contact (if applicable): If the School wishes to have a copy of the outcome of the ethical review, the relevant School officer should enter the appropriate details here.

Name:

Post:

Email address:

4. Is this study, or any part of this study a student project? Yes

If Yes what degree is it for?

Doctorate in Clinical Psychology (DClinPsy)

5. Please provide the names and email addresses of any academic staff or students involved, other than those named at 2 above:

Dr Sandra Bucci: Sandra.bucci@manchester.ac.uk

SECTION B – Details of Project

6. When will the data collection take place?

Start date: February 2014

End date: April 2015

7. Where will the data collection take place?

University of Manchester premises

8. What is the principal research question?

Whether, following distressing material, ruminative processing leads to increased pseudo voice-hearing, given the provision of anomalous auditory material.

9. What is the academic justification for the research? *(Must be in language comprehensible to a lay person)*

Prior research has shown that the way we think about stressful events can impact on the distress we feel afterwards, and how often thoughts about the event come into our mind (Ehring et al, 2008; Ehlers and Clark 2000). We also know that people who experience psychosis (hear or see things that other people don't, or have unusual distressing beliefs) tend to think about things in a different way from those who don't experience psychosis (Garety, 2001; Morrison, 2001; Waters, 2006).

Our idea is to investigate the impact of a particular way of thinking on people's experiences in reaction to stressful material. This will involve asking participants to watch an emotionally stressful film (a method that has been used a lot in previous research) and then distract themselves (complete a quiz) or 'ruminate' about the film (think about it repetitively in an abstract way). After this, participants will listen to an audio recording of jumbled-up human voice sounds and be asked if they can make out any words. This task is intended to assess voice-hearing type experiences similar to those in psychosis.

Our prediction is that if people watch the film and then ruminate about it, they will be more likely to have voice-hearing type experiences, especially if they think unexpected thoughts are dangerous or need to be controlled. Voice-hearing type experiences are common in the general population and largely do not cause distress.

We hope that the results of our study will help us to understand more about how distressing experiences develop after stressful events. In the future, this might assist with the development of specific ways to help people respond in different, more helpful ways and reduce the frequency and impact of these experiences.

10. Give a summary of the design and methodology of the planned research, including a brief explanation of the theoretical framework that informs it. It should be clear exactly what will happen to the research participant, how many times and in what order. Describe any involvement of research participants, patient groups or communities in the design of the research. *(This section must be completed in language comprehensible to the lay person and*

should be no longer than half a page. If there is a full research proposal or protocol it can be appended to the application, but it does not replace the information given in this section)

The principal aim of the study is to investigate whether experimentally induced rumination following exposure to stressful video material is related to pseudo voice-hearing experiences and the distress associated with these. Rumination is a negative perseverative thought process that is common in depression but also relevant in the context of other mental health problems. It is hypothesised that adopting a ruminative processing strategy (as compared to distraction) will result in: a greater number of voice-hearing type experiences in the post-film task; higher levels of distress associated with voice-hearing type experiences in the post-film task. It is also predicted that these links will be moderated by levels of negative beliefs such that higher scores (on questionnaires that measure people's fear of and need to control thoughts) will strengthen the relationship. Secondary aims/ hypotheses are that rumination (compared to distraction) will result in greater state-paranoia and that the qualitative content of the intrusions might converge with the nature of the video material.

The primary hypotheses will be tested using a group comparison design with the independent variables group (two levels: rumination/ distraction condition). The primary research question will also be assessed using a correlational design (relationship between level of state rumination and frequency of pseudo-hallucinations/ level of distress). Moderation analysis will use a multiple regression model and the procedures described by Frazier et al (2004). The effect of rumination on state paranoia will be assessed using a group comparison design (IV as above, DVs as continuous measures of state paranoia, frequency and distress scales). Qualitative evaluation of the nature of the intrusions (4) will utilise content analysis (Krippendorff, 1984).

Procedure:

17. Screening, written consent and baseline questionnaire measures
18. Randomisation: allocation to either rumination or distraction condition
19. Video material: presentation of a 4 min 33 second clip from 'The Brave One'- an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple
20. Manipulation: Use of written prompts to induce abstract rumination on the film content (e.g. 'why do attacks like this happen'/ general knowledge questions unrelated to the film content to induce distraction
21. Manipulation check: Perseverative thinking questionnaire
22. Voice-hearing task: Presentation of a clip of a human voice recording, which has been spliced into 1 second clips, randomised and played backwards.
23. Measure of state paranoia
24. Debrief

11. How has the scientific quality of the research been assessed? *(Tick all that apply)*

- ☒ Internal review (e.g. involving colleagues, academic supervisor)
- ☐ Review within a multi-centre research group
- ☐ Independent external review
- ☐ Review within a commercial company
- ☐ None external to the investigator
- ☐ Other, e.g. in relation to methodological guidelines *(give details below)*

If relevant, describe the review process and outcome. If the review has been undertaken but not seen by the researcher, give details of the body which has undertaken the review:

The review was completed by the Research Subcommittee panel of the University of Manchester Doctorate in Clinical Psychology programme. A proposal form was submitted, and the applicant was interviewed about the rationale, design and methodology. A copy of the approval letter can be provided, if necessary.

12.1 Does the research involve the administration of any physically invasive procedures, or physical or psychological testing?

☐ Yes ☒ No

If No, proceed to 12.2 If Yes, please ensure you complete Section F

12.2 Does the research involve interviewing participants or focus groups?

☐ Yes ☒ No

If No, proceed to 12.3

If Yes, please describe briefly how they will be conducted

Questionnaire measures as described above

12.3 Does the research involve the administration of questionnaires?

☒ Yes ☐ No

If No, proceed to 12.4

If Yes, please describe the process of delivery and collection

12.4 Is statistical sampling relevant to this research?

☒ Yes ☐ No

If No, proceed to 12.5

If Yes, please answer the following questions:

12.5.1 Has the protocol submitted with this application been the subject of review by a statistician independent of the research team? Select one of the following:

☒ Yes – copy of review enclosed

☐ Yes -
details of review available from the following individual or organisation (give contact details)

☐ No – justify below

12.4.2 If relevant, specify the statistical experimental design and why it was chosen.

12.5 If you are not using statistical sampling how was the number of participants decided upon?

12.6 Has the research methodology and/or the statistical basis been the subject of a review independent of the research team? (Select one of the following)

- ☒ Yes – copy of review enclosed
- ☐ Yes details of review available from the following individual or organisation (give contact details below)
- ☐ No – justify below

12.7 Describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study objectives.

The data will first be inspected for normality in terms of skewness and kurtosis scores, and visual inspection of the distribution. If the data is non-normally distributed, a suitable transformation will be performed and this does not remedy the situation then a non-parametric test will be used (e.g. Mann-Whitney U test).

Hallucination proneness will be converted into a dichotomous categorical variable (high vs. low) via the use of a median split, ensuring equal groups.

Assuming a normal distribution, a group mean comparison will be conducted using an independent samples t-test, with group (rumination versus distraction) as the independent variable and frequency/ distress of pseudo-psychosis experiences as the dependent variable (continuous). Moderation analysis will use multiple regression and the procedure outlined by Frazier et al (2004). If significant confounding variables are identified (as a result of inspecting the relationships between trait rumination/hallucination proneness and psychosis experiences/ differences between genders in terms of psychosis experiences), then these will be incorporated into the analysis using an Analysis of Covariance (ANCOVA) design or hierarchical multiple regression.

13.1 What do you consider to be the main ethical issues which may arise with the proposed study?

Similar, prior research within the Post-Traumatic Stress Disorder literature has not reported any adverse effects, although robust procedures around debriefing will be implemented. Participant information sheets will include signposting to local services- University Student Services, NHS 111, the Samaritans. In addition, Student Services will be informed of the study prior to commencement. The researcher will check distress at the end of experimental session and signpost where appropriate. A follow-up phone call will be made within 24 hours for those who report distress. Participants will also be provided normalising information around psychosis-like experiences. With regard to the disclosure of specific trauma, participants will be signposted to their GP to access services, where appropriate. The trauma screen asks participants to respond yes/no to assess whether or not they have experienced any of a number of example traumatic events (such as 'a really bad accident at work or home'); the participant information sheet will provide details on the nature of these questions.

13.2 What steps will be taken to address the issues raised in question 13.1?

See 13.1 above and Participant Information sheet

14. Has this or a similar application been previously considered by a Research Ethics Committee in the UK, the European Union or the European Economic Area?

☒ Yes

☐ No

If Yes give details of each application considered, including:

Name of Research Ethics Committee or regulatory authority:

Decision and date taken:

Research ethics committee reference number:

SECTION C – Details of participants

15. How many participants will be recruited? *(If there is more than one group, state how many participants will be recruited in each group. For international studies, say how many participants will be recruited in the UK and in total. Please ensure you clearly state the total number of participants)*

102 participants (randomised to 2 equal groups)

16. Age range of participants:

18 Years old or over

17. What are the principal inclusion criteria for participants? *(Please justify)*

Inclusion criteria:

1. English-speaking (as the questionnaire measures are not validated in other languages)
2. 18 years old or above (as the video footage is from a certificate 18 film)
3. Normal/ corrected vision and hearing (to ensure video footage and audio task can be completed)

18. What are the principal exclusion criteria for participants? *(Please justify)*

Exclusion criteria:

1. History of/ current contact with secondary care psychiatric services (as this would not constitute an analogue sample, and the possibility for distress/ adverse consequences might be increased)
2. Experience of physical assault (because the video footage depicts this and therefore might trigger distressing memories)
3. Having viewed the video footage previously (as this might bias the findings)

19.1 Will the participants be from any of the following groups? (Tick all that apply)

- ☒ Adult healthy volunteers (i.e. not under medical care for a condition which is directly

- relevant to the application)
- ☐ Children under 16
 - ☐ Adults with learning difficulties
 - ☐ Adults who have a terminal illness
 - ☐ Adults with mental illness (particularly if detained under mental health legislation)
 - ☐ Adults with dementia
 - ☐ Adults in care homes
 - ☐ Adults or children in emergency situations
 - ☐ Prisoners
 - ☐ Young offenders
 - ☐ Those who could be considered to have a particularly dependent relationship with the researcher, e.g. students taught or examined by the researcher.
 - ☐ Other vulnerable groups

Please note: *If an adult participant is not able to give informed consent (eg through mental capacity or is unconscious) or if a prisoner or young offender is involved in health related research ethical review should be undertaken by an appropriate NHS Research Ethics Committee.*

19.2 If you will be using participants other than healthy volunteers please justify their inclusion:

N/A

20.1 How will the potential participants be identified?

20.2 How will they be approached and by whom?

20.3 How will they be recruited? *(Where research participants will be recruited via advertisement, please append a copy to this application)*

The study will be advertised via the use of the faculty recruitment email service and posters located within university premises. Information will also be disseminated via staff members associated with the principal investigator. Potential participants will be provided with the study information sheet via email or as a hard copy and given at least 24 hours to consider this prior to screening and written consent. Recruitment materials explicitly state the nature of the study and inclusion of stressful video material. Ineligible participants will be debriefed and thanked for their time. Participant who are ineligible according to criterion 2 will also be signposted to their GP to access support services is required.

21. Will any research participants be recruited who are involved in existing research or have recently been involved in any research prior to recruitment?

✓ Yes ☐ No ☐ Not known

(If yes, give details and justify their inclusion. If Not known, please state what steps will you take to find out)

Participants involved in an allied study (Ref:**) will be asked if they consent to their details being passed to the alternative investigator, and then all usual recruitment procedures will be followed. It is unlikely that being involved in either study will invalidate responses in the alternative.

22. Will individual research participants receive *reimbursement of expenses* or any other *incentives* or *benefits* for taking part in this research?

✓ Yes ☐ No *(If yes, indicate how much and on what basis this has been decided)*

Participants will be offered a psychology career-themed seminar or entry into a raffle to receive one of two £50 gift vouchers, as a token of appreciation.

23. What is the expected total duration of participation in the study for each participant? For ethnographic research focussing on one or more groups rather than individual participants, indicate the approximate period of time over which research will focus on particular groups

1 hour.

24. What is the potential benefit to research participants?

The current study will not directly offer any patient benefit, although the results will feed into understanding of the aetiology of experiences associated with psychosis and possible intervention strategies. Although the sample will be an analogue one, there is a wealth of evidence to suggest that psychosis experiences exist on a continuum (e.g. Verdoux and van Os, 2002), and so findings can extend into the clinical field. As stated above, future intervention strategies might involve mindfulness-based approaches, or working on beliefs about rumination, which may support its use as a processing strategy outside the experimental manipulation.

25. Will any benefit or assistance, which the participant would normally have access to, be withheld as part of the research?

☐ Yes ✓ No

(If yes, give details and justification)

SECTION D – Consent

26.1 Will informed consent be obtained from the research participants?

✓ Yes ☐ No

If Yes, give details of how consent will be obtained. Give details of your experience in taking consent and of any particular steps to provide information to participants before the study takes place eg information sheet, videos, interactive material.

If participants are recruited from any of the potentially vulnerable groups listed in Question 19.1, give details of extra steps taken to assure their protection. Describe any arrangements to be made for obtaining consent from a legal representative.

If consent is not to be obtained, please explain why not.

Potential participants will be provided with the study information sheet via email or as a hard copy and given at least 24 hours to consider this prior to screening and written consent. The principal investigator (who will obtain the consent) has a number of years' experience in obtaining consent from vulnerable clients groups in the context of clinical trials.

26.2 Will a signed record of consent be obtained?

✓ Yes ☐ No

If not, please explain why not. Please append any consent forms to this application.

27. How long will the participant have to decide whether to take part in the research? (If less than 24 hours please justify)

At least 24 hours

28. What arrangements have been made for participants who might not adequately understand verbal explanations or written information given in English, or who have special communication needs? (e.g. translation, use of interpreters etc.)

Participants who do not have sufficient command of the English language will unfortunately not be able to take part in the research, as the questionnaire measures are not all validated in other languages and the video material is in English.

SECTION E – RISKS AND SAFEGUARDS

29. Activities to be undertaken (*This should be in the form of a brief list, such as answering a questionnaire, being interviewed*)

1. Screening, written consent and baseline measures: LSHS, trait rumination, MCQ
2. Randomisation: allocation to either rumination or distraction condition
3. Video material: presentation of a 4 min 33 second clip from 'The Brave One' - an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple
4. Manipulation: Use of written prompts to induce abstract rumination on the film content (e.g. 'why do attacks like this happen' / general knowledge questions unrelated to the film content to induce distraction (c.f. Zetsche 2009)
5. Manipulation check: Perseverative thinking questionnaire
6. Voice-hearing task: Presentation of a clip of a human voice recording, which has been spliced into 1 second clips, randomised and played backwards.
7. Measure of state paranoia
8. Debrief

30.1 What are the potential adverse effects, risks or hazards for research participants, including potential for pain, discomfort, distress, inconvenience or changes to lifestyle for research participants? Are they any greater than those that would arise from normal social interaction?

Similar, prior research within the Post-Traumatic Stress Disorder literature has not reported any adverse effects, although robust procedures around debriefing will be implemented as it is possible that slight distress might emerge from watching the video footage. Participant information sheets will include signposting to local services- University Student Services, NHS 111, the Samaritans. In addition, Student Services will be informed of the study prior to commencement. The researcher will check distress at the end of experimental session and signpost where appropriate. A follow-up phone call will be made within 24 hours for those who report distress. Participants will also be provided normalising information around psychosis-like experiences. With regard to the disclosure of specific trauma, participants will be signposted to their GP to access services, where appropriate.

30.2 Could individual or group interviews/questionnaires raise any topics or issues that might be sensitive, embarrassing or upsetting, or is it possible that criminal or other disclosures requiring action could take place during the study (e.g. in the application of screening tests for drugs)?

☐ Yes ☐ No

If yes, provide your distress policy/give details of procedures in place to deal with these issues:

See above

30.3 What precautions have been taken to minimise or mitigate the risks identified above?

See above- 30.1

31.1 What is the potential for adverse effects, risks or hazards, pain, discomfort, distress, or inconvenience to the researchers themselves? (If any)

None

31.2 Where will the research take place?

University of Manchester premises (computer clusters booked solely for the purpose of this study).

31.3 What precautions have been taken to minimise or mitigate the risks identified above? (If the research means working alone in a location which is not public, semi-public or otherwise risk-free, please describe your lone worker policy or append a copy)

N/A

32. The University will automatically provide indemnity and/or compensation for most approved studies, but you should complete the appended Ethics Insurance Assessment form and consult the University Procurement Office if necessary. If another body or institution is providing insurance or indemnity please provide details below.

33. Please confirm that any adverse event requiring a radical change of method or design, or even abandonment of the research, will be reported to the Committee.

Yes.

SECTION F – MEDICAL INTERVENTION

This section need only be completed by applicants whose project involves any form of medical, psychological or therapeutic intervention (ie you answered ‘Yes’ o question 12.1)

N/A

34. Drugs and other substances to be administered (if applicable)

Indicate status, eg full product licence, CTC, CTX. Attach: evidence of status of any unlicensed product; and Martindales Phamacopoeia details for licensed products

DRUG	STATUS	DOSAGE/FREQUENCY/ROUTE
------	--------	------------------------

35. Procedures to be undertaken

Details of any invasive procedures, and any samples or measurements to be taken. and/or any psychological tests etc. What is the experience of those administering the procedures?

36. Will any procedures which are normally undertaken be withheld?

N/A

37.1 Will the research participants' General Practitioner be informed that they are taking part in the study?

☐ Yes ☐ No

If No, explain why not

N/A

37.2 If you answered yes to question 37.1, will permission be sought from the research participants to inform their GP before this is done?

☐ Yes ☐ No

If No, explain why not

N/A

38. What are the criteria for electively stopping research prematurely?

N/A

SECTION G – Data protection and confidentiality

39. Will the research involve any of the following activities at any stage (including identification of potential research participants)? (Tick all that apply)

Storage of personal data on any of the following:

- ☒ Storage of personal data on manual files
- ☐ Storage of personal data on laptops or other personal computers
- ☐ Storage of personal data on University computers
- ☐ Storage of personal data on NHS computers
- ☐ Storage of personal data on private company computers
- ☐ Use of audio/visual recording devices
- ☒ Use of personal addresses, postcodes, faxes, e-mails or telephone numbers
- ☐ Electronic transfer by magnetic or optical media, e-mail or computer networks
- ☐ Examination of medical records by those outside the NHS, or within the NHS by those who would not normally have access
- ☐ Sharing of data with other organisations
- ☐ Export of data outside the European Union
- ☐ Publication of direct quotations from respondents
- ☐ Publication of data that might allow identification of individuals

Further details:

40. What measures have been put in place to ensure confidentiality of personal data? Give details of what encryption or other anonymisation procedures will be used and at what stage? Note: the University requires all personal data stored electronically to be held on wholly managed University servers or to be encrypted.

On consent, participants will be provided with an identification number and this will be used to identify all other data provided by that participant. Data will be anonymised in this way and kept separate from personal information (i.e. name, email address)

41.

Where will the analysis of the data from the study take place and by whom will it be undertaken?

University of Manchester premises by the principal investigator.

42.1 Who will control and act as the custodian for the data? Note: for a student project this must be a supervisor or a permanent member of staff

Professor Tony Morrison

42.2 Who will have access to the data?

Only the research team listed above

42.3 Will the data be stored for use in future studies? If yes, has this been addressed in the consent process?

No

43. For how long will the data from the study be stored?

5 Years

Note: the University requires non-medical data to be held for a minimum of 5 years and medical data to be held for a minimum of 10 years after the completion of the research. Some funding bodies require storage for longer periods.

44. What arrangements are in place to ensure participants receive any information that becomes available during the course of the research that may be relevant to their continued participation?

Participants will be emailed a newsletter containing the study findings and implications of these within 6 months of recruitment ending.

45. What arrangements are in place for monitoring the conduct of the research by parties other than the researcher?

The DClinPsy Research [programme] team monitor large scale research projects at yearly reviews.

Will a data monitoring committee be convened?

☐ Yes

☒ Not relevant

SECTION H – Conflict of Interest

46.1 Will individual *researchers* receive any personal payment over and above normal salary and reimbursement of expenses for undertaking this research?

☐ Yes ☒ No

If Yes, indicate how much and on what basis this has been decided:

46.2 Does the principal researcher or any other investigator/collaborator have any direct personal involvement (e.g. financial, share-holding, personal relationship etc.) in the organisation sponsoring or funding the research that may give rise to a possible conflict of interest?

☐ Yes ☒ No

If Yes, give details:

47. Will the host organisation or the researcher's department(s) or institution(s) receive any payment of benefits in excess of the costs of undertaking the research?

☐ Yes ☒ No

If Yes, give details:

SECTION I - Reporting Arrangements

48. How is it intended the results of the study will be reported and disseminated?

(Tick as appropriate)

- ☒ Peer reviewed academic journals
- ☐ Book or contribution to a book
- ☐ Other published outlets e.g. ESRC or Cochrane Review,
- ☒ Thesis/dissertation
- ☒ Conference presentation
- ☒ Internal report
- ☒ Other e.g. deposition in University Library

49. How will the results of research be made available to research participants and communities from which they are drawn?

- ☐ Presentation to participants or relevant community groups
- ☒ Written feedback to research participants
- ☐ Other e.g. videos, interactive website

50.1 Will dissemination allow identification of individual participants?

☐ Yes ☒ No

If No, proceed to 51

If Yes, indicate how these individuals' consent will be obtained:

50.2 Will dissemination involve publication of extended direct quotations from identified participants and/or distribution of audiovisual media in which identified participants play leading roles?

☐ Yes ☒ No

If No, proceed to 52

If Yes, indicate how the participants' possible Intellectual Property or Performance Rights in these outputs will be negotiated. Where relevant, attach a model of the release form that will be used.

50.3 Are special arrangements needed to provide indemnity and/or compensation in the event of a claim by, or on behalf of, participants on grounds such as libel, breach of confidence and infringement of Intellectual Property or Performance Rights?

No

SECTION J – Funding and sponsorship

51. Has external funding for the research been secured?

☐ Yes ☒ No

If Yes, give details of funding organisation(s) and amount secured and duration:

Organisation:

UK contact:

Amount (£):

Duration: Months


52. Name of organisation which will act as Sponsor for the research, if other than the University:

***Note:** the University will normally act as Sponsor (ie responsible for the design, management and conduct of the research project by University staff and/or students), but in some cases of externally commissioned research the funder will be the Sponsor. If this is the case please provide details)*

None other than university

SECTION K – Confirmation of Application

Signature(s) of applicant(s):



17/1/14_____

SIGNATURE

DATE

Dr. Samantha Hartley, Trainee Clinical Psychologist

NAME AND POST OF APPLICANT (PLEASE PRINT)

SIGNATURE

DATE

NAME AND POST OF APPLICANT (PLEASE PRINT)

Signature by or on behalf of the Head of School

The Committee expects each School to have a pre-screening process for all applications for an ethical opinion on research projects. The purpose of this pre-screening is to ensure that projects are scientifically sound, have been assessed to see if they need ethics approval and, if so, go to the relevant ethics committee. It is not to undertake ethical review itself, which must be undertaken by a formal research ethics committee.

The form must therefore be counter-signed by or on behalf of the Head of School to signify that this pre-screening process has been undertaken.

I approve the submission of this application


18/02/2014

SIGNED BY OR ON BEHALF OF HEAD OF SCHOOL

Date

Professor Gillian Haddock

Appendix 17: Ethics approval



**Secretary to Research Ethics Committee 5
Faculty Office - Devonshire House**

Tel: 0161 275 0288

Email: jared.ruff@manchester.ac.uk

Dr Samantha Hartley
The University of Manchester
2nd April 2014

Dear Dr Hartley

Research Ethics Committee 5 (Flagged Humanities) - Project Ref 14054

Hartley, Morrison, Bucci: Rumination in response to stressful material: an analogue study of the role of perseverative processing in voice-hearing (ref 14054)

I am writing to thank you for coming to meet with the University Ethics Committee 5 (flagged Humanities) on 10th March 2014 and for submitting the requested changes and clarification to the original material. This letter formally confirms approval for the above project and that no further changes are required to the documentation submitted to the committee.

This approval is effective for a period of five years and if the project continues beyond that period it must be submitted for review. It is the Committee's practice to warn investigators that they should not depart from the agreed protocol without seeking the approval of the Committee, as any significant deviation could invalidate the insurance arrangements and constitute research misconduct. We also ask that any information sheet should carry a University logo or other indication of where it came from, and that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a university computer or kept as a hard copy in a location which is accessible only to those involved with the research.

Finally, I would be grateful if you could complete and return the attached form at the end of the project.

I hope the research goes well.

Yours sincerely

Jared Ruff
Senior Research Manager
Faculty of Humanities and Secretary to UREC 5 (Flagged Humanities)
0161 275 0288 Jared.ruff@manchester.ac.uk

Appendix 18: Video clip pilot

Six informal contacts of the trainee (2 males and 4 females) were approached and asked to view the video clip and provide feedback (see below). All participants agreed that they could envisage themselves being able to think about the film clip for a few minutes, if instructed to do so. The mean rating of how upsetting/distressing the video clip was calculated as 5.2, which equates to 'moderately'. No participants rated the film as 'very' distressing and no participants rated 'not at all'.

Informal pilot- Experiences of watching a clip of 'The Brave One'

Please respond to the following questions. No identifying information will be collected and the data will be used only to inform the study design; answers will not be shared outside of the research supervisory team.

1. I watched the 4 min 33 second clip from 'The Brave One'- an 18 certificate film depicting a violent physical assault on a heterosexual, mixed-race couple (please tick)

Yes

☐

No

☐

2. The film clip was upsetting/ distressing (please circle a number):

1	2	3	4	5	7	8	9	10
Not at all		A little		Moderately		Quite a lot		Very much

3. I could envisage being able to think about the film clip for a few minutes, if instructed to do so (please tick)

Yes

☐

No

☐

Any other comments?

Thank you for your time.

Appendix 19: Rumination prompts

Original Rumination prompts

1. What if I was attacked like the couple were?
2. Why do people have to be so violent?
3. How would I cope if that happened to me?
4. What if I had to deal with the trauma of that situation?
5. Why do bad things have to have to good people?
6. Why is the world such a dangerous place?
7. What if I couldn't cope afterwards?
8. Why is the world so unpredictable?
9. What if something even worse happened to me or my family one day?

Rumination prompts after consultation

1. What if I was attacked like the couple were?
2. Why do people have to be so violent?
3. How would I cope if that happened to me?
4. What if I had to deal with the effects of that situation?
5. Why do bad things happen to good people?
6. Why is the world such a dangerous place?
7. What if I couldn't cope afterwards?
8. Why is the world so unpredictable?
9. What if something even worse happened to me or my family one day?
10. Why would people want to hurt others?
11. What if I couldn't protect myself?
12. Why is the world so unfair?

Appendix 20: Distraction prompts

List States of America that begin with the letter M or N

List London Underground stations

List fruits and vegetables that begin with a vowel

List 5 European capital cities

List planets in our solar system

List elements from the periodic table

Appendix 21: Newsletter

MANCHESTER
1824

The University of Manchester

Reactions to stressful events

Aims

The aim of the project was to understand more about why some people come to experience voices after stressful events and some do not. Specifically, we wanted to examine whether the way people think about information may have an effect on the type of things they experience afterwards and how distressing they find this.

Method

Everyone who participated in the study watched a film clip depicting interpersonal violence and abusive language. Half the group were then asked to think repetitively and abstractly about the contents (to ruminate) and half distracted themselves with a series of general knowledge questions. All participants then listened to a recording of human speech that had been spliced into 1 second clips, randomly organised and played backwards. The task was to record any words or phrases people experienced, distress and paranoid ideas.

Findings

The group instructions worked, with the rumination group thinking more about the film contents than the distraction group. However, our hypotheses were not upheld; the rumination group did not hear more words or get more distressed by this, and also did not feel any more paranoid. It might be that rumination is involved more in the maintenance of stressful experiences, rather than their initial development.

What we know about 'hearing voices'

Having uncomfortable or strange experiences, like hearing words or voices when no one is around is very common and not necessarily a sign of 'psychosis'. The audio material used in this study has been used previously, demonstrating that some people will hear multiple words, some a few and some none; there is a great deal of variation and likely a continuum of experience.

Thank you

Thank you to all of the people that took in our study; your time is greatly appreciated. The prize draw has been completed and the careers seminar has been delivered. If you have any further questions or would like to be notified when publications arising from the research are available, please get in touch:

Sam Hartley (ClinPsyD Trainee)

samantha.hartley@manchester.ac.uk

Appendix 22: BABCP conference poster acceptance

From: Janine BABCP Conference [janine.babcp@reading.ac.uk]
Sent: 20 April 2015 19:57
To: Samantha Hartley
Subject: BABCP Open Paper submission

Dear Samantha

BABCP 2015 Open Paper submission, University of Warwick, 21st-24th July 2015

I am pleased to inform you that your submission has been accepted by the Scientific Committee into the Conference Programme as a **Poster Presentation**. Please see the attached letter for more details and information.

I would be grateful if you could let me know if you would like to accept this invitation by return email.

I do apologise for the delay in sending this outcome to you, we received an extremely large number of submissions this year.

Best wishes
Janine

Janine Turner
CYP IAPT Administrator
Charlie Waller Institute
School of Psychology & CLS
University of Reading
Earley Gate
Reading RG6 6AL
Tel: 0118 378 7537
Fax: 0118 3786715