The role of metacognitive beliefs in clinical and non-clinical paranoia

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Thesis Abstract

This thesis explored the role of metacognitive beliefs in paranoia. The thesis is divided into three sections. Paper 1 presents a review of the current evidence relevant to the metacognitive model of paranoia. Paper 2 extends the evidence base by empirically manipulating metacognitive beliefs in non-clinical paranoia. Papers 1 and 2 have been prepared for submission to Acta Psychiatrica Scandinavica and Psychosis respectively. Within the thesis, references, tables and figures are presented in a consistent format to facilitate readability. Paper 3 represents a critical evaluation of the methods carried out in papers 1 and 2. More specifically, paper 1 reports a systematic review that examines the applicability of the metacognitive model to explain the development and maintenance of paranoia. Studies investigating testable predictions of the metacognitive model of paranoia have focused on assessing the relationship between metacognitive beliefs and paranoia. Ten studies meeting the inclusion criteria exploring the relationship between metacognitive beliefs and paranoia were identified through database searching and were included in the review. Results showed a lack of evidence with regards to the causal role of metacognitive beliefs in the development of paranoia, thus providing limited support for the metacognitive model of paranoia. The strengths and weakness of the studies and of the review were discussed along with theoretical and clinical applications and recommendations for future research.

In the absence of evidence supporting a causal relationship between metacognitive beliefs and paranoia, Paper 2 aimed at investigating the direct impact of manipulating metacognitive beliefs on paranoia frequency and associated distress. Paper 2 reports an experimental analogue study in which participants (n = 110) were randomized to either a positive or negative manipulation group intended to alter beliefs about paranoia before entering a paranoia induction task. The metacognitive beliefs manipulation was partially successful. In line with predictions, the positive group reported an increase in paranoia frequency after the paranoia induction, whereas, contrary to predictions, participants in the negative beliefs group reported a decrease in paranoia related distress. Clinical and research implications of the experimental findings are considered. Paper 3 provides a critical appraisal of the research process as a whole. Strengths and limitations of the research are presented along with clinical implications, and suggestions for future research.

Declaration

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

Copyright statement

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Paper One: Systematic review

Title

Associations between metacognitive beliefs and paranoia in clinical and non-clinical samples: A systematic review

Associations between metacognitive beliefs and paranoia in clinical and non-clinical samples: A systematic review

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Abstract

Overview: The causal relationship between metacognitive variables and paranoia needs to be established before clinical interventions based on the metacognitive approach can be recommended in routine clinical practice. To date, no systematic review has examined the applicability of the metacognitive model to explain the development of paranoia. Therefore, this review aimed to identify, synthesise and critically appraise research investigating the relationship between metacognitive beliefs and paranoia in both clinical and non-clinical samples.

Method: A systematic literature search of relevant papers published between January 1990 and May 2015 was conducted using the following electronic databases: PsychINFO, PubMed, MEDLINE and Embase.

Results: A total of ten clinical (n = 4) and non-clinical (n = 6) studies were identified that satisfied inclusion criteria for the review. Six studies assessed metacognitive beliefs using the Metacognitions Questionnaire and the remaining four using the Beliefs About Paranoia Scale. Studies reviewed found some evidence supporting an association between metacognitive beliefs and paranoia and the distress associated with it. However, as it stands the evidence does not permit conclusions with regards to the causal role of metacognitive beliefs in the development of paranoia.

Conclusion: There is some evidence to support the role of metacognitive beliefs in paranoia. Quality assessment of the studies highlighted that the findings should be interpreted with caution due to methodological weaknesses. Further rigorous research is needed before the causal role of metacognitive beliefs in the development of paranoia can be established.

Keywords: paranoid disorders; psychotic disorders, cognition; anxiety

Summations

- Metacognitive beliefs are associated with clinical and non-clinical paranoia
- The data are largely cross-sectional and correlational; conclusions of causality cannot be established

Considerations

- There is a need for studies with longitudinal and experimental designs to explore the causal role of metacognitive beliefs in the development of paranoia and distress

- Future studies should consider providing data on levels of paranoia frequency and distress and using measures of metacognitive beliefs specific to paranoia
- Research in this area would be aided by the development of measures that assess a range of metacognition dimensions relevant to paranoia

Introduction

Paranoia encompasses experiences ranging from ordinary suspiciousness through to more extreme persecutory delusions (Freeman & Garety, 2006). Paranoid or persecutory delusions are one of the most prevalent symptoms of psychosis (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002). Persecutory delusions are often associated with depression (Drake et. al., 2004), anxiety (Freeman & Garety, 1999; Hartley, Barrowclough, & Haddock, 2013), and tend to be distressing or disruptive for the individual experiencing them (Freeman & Garety, 2006).

The difficulties encountered in distinguishing between persecutory delusions and other types of delusions (such as of sin, guilt and delusions of reference) have in recent years led researchers to propose operational criteria for classifying delusions as persecutory: 'the individual believes that harm is occurring, or is going to occur, to him or her, and that the persecutor has the intention to cause harm' (Freeman & Garety, 2000; p. 412). Persecutory delusions have traditionally been viewed as a symptom of severe mental health problems such as schizophrenia, and have been associated with a variety of psychiatric diagnoses including unipolar depression (Frangos, Athanassenas, Tsitourides, Psilolignos, & Katsanou, 1983) and post-traumatic stress disorder (Freeman et al, 2013). The well-documented problems with the lack of validity of psychiatric diagnoses (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Bentall, 2004) has led to some researchers advocating use of the single-symptom approach to research; an approach that separates and studies psychological phenomena independently (Persons, 1986; Freeman & Garety, 2004; Bentall, 2006; van Os, Gilvarry, Bale, Van Horn, Tattan, & White, 1999). This has allowed a clearer focus on the dimensions of individual symptoms, such as preoccupations and distress, and has led to more targeted interventions.

The continuum hypothesis

Researchers have argued that some of the problems with categorisation can be resolved by locating persecutory delusions on a continuum with ordinary beliefs (van Os, Hanssen, Bijl, & Ravelli, 2000). Consistent with this proposal, studies have shown that persecutory delusions are a complex and multi-dimensional phenomenon rather than discrete discontinuous entities; they vary across a number of dimensions and attitudes (e.g. level of conviction, preoccupation, distress; Garety & Hemsley,

1994). Furthermore, the continuum approach implies that persecutory ideas may be found in less severe forms in individuals who have not sought help from mental health services. Results form the second British National Survey (n = 8580) looking at paranoid thoughts in the general population showed that such thoughts ranged from 2% to nearly 30% and followed an almost perfect exponential distribution (Bebbington et al., 2013). Findings such as these lend strong support to the idea that persecutory ideas range from vaguely held thoughts to full-blown delusions and are evident in clinical and non-clinical populations. One important implication of the continuum hypothesis is that conducting research in non-clinical paranoid experiences can inform our understanding of clinically severe persecutory delusions (Freeman et al., 2008).

The metacognitive account of paranoia

The Self-Regulatory Executive Function (S-REF, Wells, 2002; Wells & Matthews, 1996; 2014) model has provided a useful framework for understanding vulnerability to paranoia. Within this theory, metacognition is defined as the 'knowledge or cognitive processes involved in the appraisal, control, and monitoring of thinking' (Wells, 2007; pg. 18). This theory argues that psychological difficulties and their maintenance are associated with a style of thinking called the Cognitive-Attentional Syndrome (CAS), characterised by worry, rumination, an attentional style of threat monitoring and the use of coping behaviours. Moreover, the S-REF theory highlights the role of metacognitive beliefs in the activation and persistence of the CAS and their involvement in vulnerability to, and maintenance of, psychopathology. In other words, an individual's metacognitive knowledge or beliefs will drive the implementation of unhelpful coping strategies such as worry and rumination. Furthermore, it predicts that positive beliefs about mental events will be associated with an increase in frequency, whereas negative beliefs about such experiences will be associated with distress and disability.

Several empirical studies have investigated the application of the S-REF to paranoia by investigating the role of metacognitive beliefs in clinical and analogue samples (Morrison et al., 2005; Morrison et al., 2011; Gumley et al., 2011). These studies provided results consistent with predictions made by the S-REF that positive and negative beliefs about paranoia will be associated with an increase in paranoia frequency and paranoia related distress. In light of these findings, Morrison and

colleagues (Morrison et al., 2005; Morrison et al., 2011; Gumley et al., 2011) proposed a model where paranoia, driven by the presence of positive beliefs, may be adopted as a strategy to manage perceived interpersonal threat. According to this model, distress may arise in response to the activation of negative beliefs about the experience of paranoia.

Aims of the review

Before considering clinical applications that may follow from the metacognitive beliefs model of paranoia, the applicability of the metacognitive model to explain the development and maintenance of paranoia should be examined. Most of the empirical studies investigating testable predictions of this model have focused on the role of metacognitive beliefs and their association with paranoia. Therefore, this review will identify, synthesise and critically appraise research that has investigated the relationship between metacognitive beliefs and paranoia in both clinical and non-clinical samples.

Method

Search strategy

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009). A literature search of relevant papers published between January 1990 and May 2015 was conducted using the following electronic databases: PsychINFO, PubMed, MEDLINE and Embase. Two search sets were used and linked with the Boolean operator 'AND.' The first set search related to paranoia and used the terms 'suspicious*', 'paranoi*', 'persecutory', 'delusion', 'hallucination', 'unusual belief', 'schizo*', 'psychosis'. The second search set related to metacognitive beliefs and included the term: 'metacog*'; each term was linked with the instruction 'OR'. Terms were entered for searching in the title, abstracts, contents and key concepts, with limits of 'All journals' and 'English Language'.

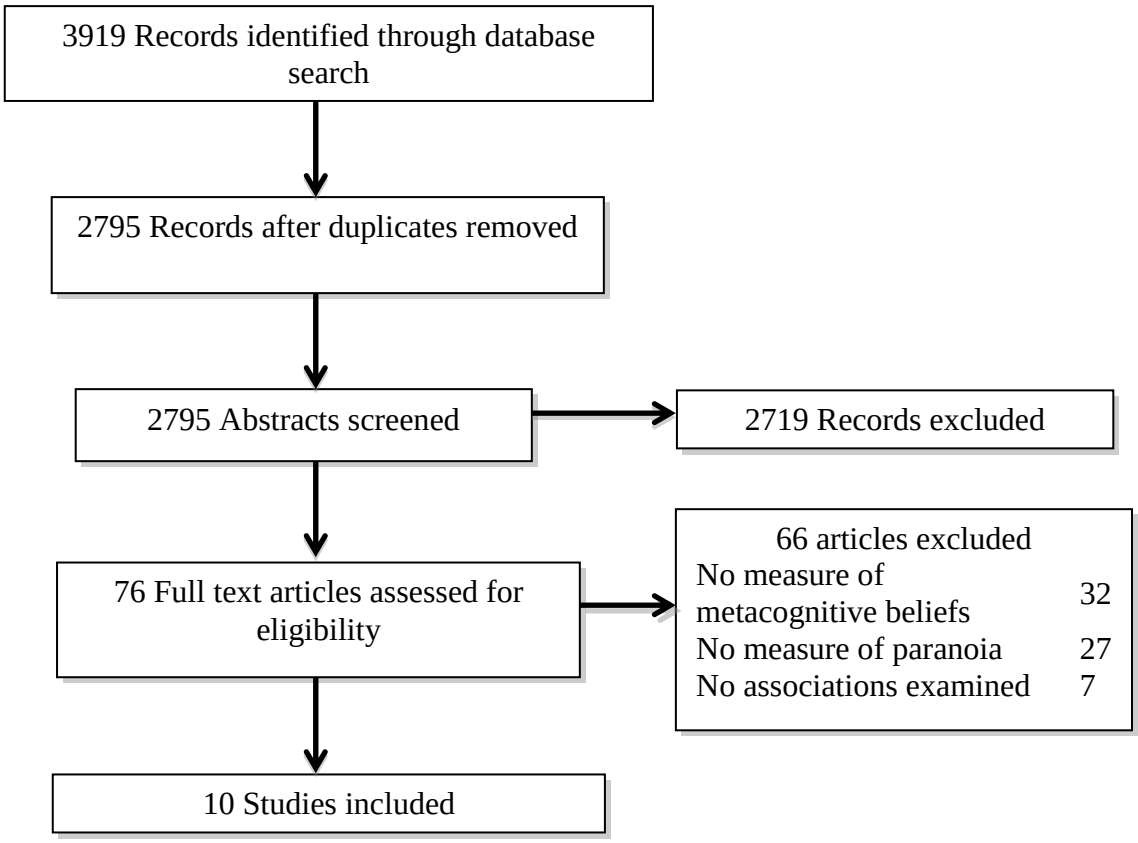

Figure 1. Flowchart of the study selection process

The study selection process is illustrated in Figure 1. The database search produced 3919 articles. This number was reduced to 2795 after excluding duplicates. The titles and abstracts of the 2795 papers were manually reviewed for relevance by the first author. This process identified 2719 articles that did not meet the inclusion criteria and were thus, excluded. To assess reliability of this first stage screening process, an independent researcher screened a sample of 10% of abstracts, with high inter-rater reliability (k = 0.758). The remaining 76 studies were retrieved and examined in full for eligibility. Inter-reliability between the first author and independent rater was perfect (k = 1). Reference lists of included articles were reviewed for additional papers. This search did not identify additional papers, and also revealed that no similar systematic review had previously been published. Any disagreements were resolved through discussion amongst the research team until full consensus was reached about the inclusion/exclusion of papers.

Eligibility criteria

Consensus on the criteria was established among all authors, prior to the literature search. Studies were considered eligible as follows: (i) investigated the relationship between metacognitive beliefs and paranoia using correlational or regression approaches, or reported data on metacognitive beliefs of group comparisons between paranoia and non-paranoia groups; (ii) included a psychometrically reliable and validated measure of paranoia and/or a diagnostic schedule for persecutory delusions; (iii) measured metacognitive beliefs using the Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997) or the Beliefs About Paranoia Scale (BAPS; Morrison et al. 2005; Gumley et al. 2011); (iv) published in peer-reviewed journals; and (v) published in the English language. Other measures of metacognition (such as the Self-Consciousness Scale by Feningstein et al., 1975) were not included as the MCQ and BAPS are the only two measures that assess dimensions of metacognition thought to be directly relevant to psychological constructs as conceptualised by the S-REF.

Quality assessment

Included studies were assessed for methodological quality to support the critical evaluation of their findings (Liberati et al., 2009). The Effective Public Health Practice Project tool (EPHPP; Thomas et al., 2004) has been recommended for use in systematic reviews of non-randomised intervention studies (Deeks et al., 2003) and was used in the current review as it has good content and construct validity (Thomas et al., 2004) and inter-rater reliability (Armijo-Olivo et al., 2012). Moreover, it facilitates the evaluation of a range of study designs and follows a clear assessment framework. Ratings (weak/moderate/strong) were made across six domains: A) selection bias; B) study design; C) confounders; D) blinding; E) data collection and F) withdrawals. Global ratings were then calculated, whereby 'strong' consisted of no weak ratings, 'moderate' one weak rating and 'weak' two/more weak ratings (see Appendix A). To allow for meaningful interpretation of findings the current review also took advantage of the EPHPP's flexibility by making ratings on an adapted scale only utilising the domains pertinent to non-intervention studies (domains A, C and E, as per Davies et al., 2013; Michailidou et al., 2014). This method is also consistent with recommendations that quality assessment tools should include a small number of key domains and be as specific as possible to the particular study designs (Sanderson

et al., 2007). Domain specific and global quality ratings are provided in Table 1. The first author completed all quality assessments and a proportion of these (20% of the total yielded) were rated by a researcher independent to the study to ensure inter-rater reliability, with high levels of agreement found (k = 0.874).

Results

Out of 76 studies, 10 met the full inclusion criteria. Table 1 provides an overview of the reviewed studies and their global and adapted quality rating. All studies were published in the last 12 years, with the majority conducted within the UK (*n* = 7), two in Spain and one in Switzerland.

To investigate the association between metacognitive beliefs and paranoia, both clinical (Morrison & Wells, 2003; Fraser et al., 2006; Valiente et al., 2011; Morrison et al., 2011) and analogue samples (Larøi et al., 2005; Garcia-Montes et al., 2005; Varese et al., 2011; Morrison et al., 2005; Campbell & Morrison, 2007; Gumley et al., 2011) were used. Based on the data provided in the clinical studies, sample size ranged from 45 to 300 with three studies (Morrison & Wells, 2003; Valiente et al., 2012; Morrison et al., 2011) including over 100 participants. The mean age of participants was 34.0 years (range of 34 – 41 years), and the majority of participants included were female (*n* = 356). The samples in the non-clinical studies ranged from 147 to 373, with three studies including over 300 participants (Varese et al., 2011; Campbell & Morrison, 2007, Morrison et al., 2005). The mean age for the non-clinical sample was 21.5 years (range of 14.8 – 25.5) and involved more female than male participants.

Measurement

To assess for the presence of persecutory beliefs, clinical studies used either DSM-IV (APA, 1994) diagnostic criteria (Morrison & Wells, 2003; Fraser et al., 2006), the positive symptom items of the Positive and Negative Syndrome Scale (PANNS; Morrison et al., 2011) or the Present State Examination-10th edition (Valiente et al., 2012). Out of six non-clinical studies, four assessed the presence of paranoia proneness using the Paranoia Scale (Gumley et al., 2011; Campbell & Morrison, 2007; Morrison et al., 2005; Garcia-Montes et al., 2005), one study used the

persecution subscale of the Persecution and Deservedness Scale (PADS; Varese et al., 2011) and another used the suspiciousness and persecutory ideas item of the French version of the Peters et al. Delusions Inventory (PDI-21; Larøi et al., 2005). In line with the inclusion criteria, studies exploring the role of metacognitive beliefs in paranoia used various versions of the MCQ and the BAPS. Out of four clinical studies, three investigated the association between metacognitive beliefs and paranoia using the MCQ (Valiente et al., 2012; Fraser et al., 2006; Morrison & Wells, 2003) and one study used the BAPS (Morrison et al., 2011).

Table 1. Studies investigating the association between metacognitive beliefs and paranoia

Study #. Author / Year	N	Assessment of paranoia	Assessment of metacognitive beliefs	Overall quality rating	Adapted quality rating
Clinical studies					
Morrison and Wells (2003) UK	Voice hearers (n = 49); Persecutory delusions group (n = 24) Panic disorder group (n = 35) Non-clinical controls (n = 50)	DSM-IV (APA, 1994)	MCQ-65	2- Moderate	1- Strong
Fraser et al. (2006) UK	Persecutory delusions group (n = 15) Panic control group (n = 15) Healthy controls (n = 15)	DSM-IV (APA, 1994)	MCQ-30	3- Weak	3- Moderate
Valiente et al. (2012) Spain	Persecutory group (n = 55) Depression group (n = 38) Non-clinical controls (n = 44)	Present State Examination (10^{TH} ed.; PSE-10).	MCQ-30	3- Weak	2- Moderate
Morrison et al. (2011) UK	Southampton patients with a diagnosis of schizophrenia (n = 62); Manchester patients who met criteria for schizophrenia, schizoaffective or schizophreniform disorder (n = 32); Glasgow patients who met criteria for schizophrenia (n = 28); non-clinical group (n = 178)	Southampton: Psychotic screening module of the Structured Clinical Interview for DSM-IV (SCID); Manchester and Glasgow: PANNS (Kay et al., 1988)	BAPS-18	3- Weak	2- Moderate
Non-clinical studies					
Larøi et al. (2005) Switzerland	Non-clinical participants (n = 296)	PDI-21 (Peters & Garety, 1996)	French MCQ-65	3- Weak	3- Weak
Garcia-Montes et al. (2005) Spain	Non-clinical participants (n= 147)	Paranoia Scale (Feningstein & Vanable, 1992)	Spanish MCQ-65	3- Weak	2- Moderate
Varese et al. (2011) UK	Non-clinical participants (n = 388)	PADS (Melo et al., 2009)	MCQ-30	3- Moderate	3- Strong
Morrison et al. (2005) UK	Non-clinical sample (n = 370)	Paranoia Scale (Feningstein & Vanable, 1992)	BAPS-31	3- Weak	2- Weak
Campbell and Morrison (2007) UK	Non-clinical sample (n = 373)	Paranoia Scale (Feningstein & Vanable, 1992)	BAPS-37	2- Weak	1- Moderate
Gumley et al. (2011) UK	Non-clinical sample (n = 185)	Paranoia Scale (Feningstein & Vanable, 1992)	BAPS-50	3- Weak	2- Moderate

MCQ, Metacognitions Questionnaire (Wells & Cartwright-Hatton, 2004); BAPS, Beliefs about Paranoia Scale (Morrison et al., 2005; Gumley et al., 2011)

For the non-clinical studies, three used the MCQ (Varese et al., 2011; Larøi et al., 2005; Garcia-Montes et al., 2005) and three used the BAPS (Gumley et al., 2011; Campbell & Morrison, 2007; Morrison et al., 2005). All the studies utilised a cross-sectional design; clinical studies compared individuals experiencing persecutory delusions with individuals experiencing panic (Morrison & Wells, 2003; Fraser et al., 2006), depression (Valiente et al., 2012) and non-clinical controls (Morrison & Wells; Fraser et al., 2006; Valiente et al., 2012; Morrison et al., 2011). Analogue studies recruited university (Larøi et al., 2005; Garcia-Montes et al., 2005; Varese et al., 2011; Morrison et al., 2005; Gumley et al., 2011) and school (Campbell & Morrison, 2007) students.

Study quality

Quality ratings are presented in Table 1 for both the full and adapted versions of the EPHPP. Studies with clinical samples were considered to include participants that were representative of the target population in the selection bias domain ('somewhat likely' and rated 'moderate'), whereas non-clinical studies did not ('not likely' and rated 'weak'). Only one study (Campbell & Morrison, 2007) reported the number of selected individuals who agreed to participate. The cross-sectional nature of the studies meant that they all rated 'weak' with regard to 'study design'. One study avoided confounders through the use of a matched design (Morrison & Wells, 2003) whilst others used statistical analyses to control for 'most' (Varese et al., 2011; Gumley et al., 2011) or 'some' confounders (Morrison et al., 2011; Garcia-Montes et al., 2005). The remaining clinical (Fraser et al., 2006; Valiente et al., 2012) and non-clinical (Larøi et al., 2005; Morrison et al., 2005) studies rated 'weak' for the confounders domain. The measures used to assess metacognition were considered to be valid and reliable. Finally, the withdrawals and drop-outs domain was not relevant for the studies included, and they all rated 'moderate', a rating that is in keeping with EPHPP instructions.

Main findings

All 10 studies reviewed found evidence supporting an association between metacognitive beliefs and paranoia. On the basis that the MCQ and BAPS assess slightly different metacognitive constructs, study results in this review are described by type of measure (i.e. MCQ and BAPS).

Metacognitive beliefs and paranoia in clinical and non-clinical samples using the MCQ

Three clinical (Morrison & Wells, 2003; Fraser et al., 2006; Valiente et al., 2012) and three non-clinical (Larøi et al., 2005; Garcia-Montes et al., 2005; Varese et al., 2011) studies investigated the association between metacognitive beliefs and paranoia using the MCQ. Morrison and Wells (2003) compared differences in metacognitive beliefs between three sub-groups of people with different DSM-IV diagnoses and a control group. Specifically, they compared individuals who met criteria for schizophrenia with hallucinations (n = 49), schizophrenia with persecutory delusions (n = 24), individuals with panic (n = 35) and a control group (n = 50). The latter was selected in order to approximately match the clinical groups for age and gender. Individuals reporting persecutory delusions scored significantly higher than controls on the negative beliefs about uncontrollability and danger (F(3, 154) = 59.41, p = .001), negative beliefs including responsibility and superstition (F(3, 154) = 53.48, p = .001) and cognitive confidence (F(3, 154) = 28.69, p = .001) subscales. Furthermore, the persecutory delusions group scored significantly higher than the panic group on the cognitive confidence subscale (F(3, 154) = 28.69, p = .001), though no other differences were noted between these two groups. Finally, the persecutory delusions group did not score any higher than the voice-hearing group on any of the MCQ subscales. An attempt to reduce the influence of confounding factors was made by using a matched-design; however, the effect of other variables (such as anxiety) on metacognitive beliefs was not taken into account.

In a subsequent study, Fraser, Morrison, and Wells (2006) compared people with persecutory delusions (DSM-IV; n = 15) versus panic (n =15) versus a healthy control group (n =15) on the MCQ-30, and found similar findings with the previous study, between the persecutory and healthy control group: the persecutory delusions group scored significantly higher on all five MCQ subscales than the healthy control group. The only significant difference between the delusions and panic control groups was the positive beliefs about worry subscale (F(2, 40) = 5.45, p = .008), with the panic group scoring significantly lower than the delusions group. Due to the small sample size, this study was lacking in statistical power, which may have compromised the veracity of findings.

Valiente et al. (2012) examined metacognitive beliefs using the MCQ-30 in participants with persecutory delusions (as identified by the PSE-10; n = 55),

participants with depression (n = 38) and a group of healthy participants (n = 44). Individuals with persecutory delusions scored significantly higher than non-clinical participants on a number of MCQ subscales, including uncontrollability and danger and need to control thoughts ($t(91) = 4.48$, $p < .001$). There was no difference on metacognitive beliefs between clinical groups. The authors made an attempt to reduce the potential impact of confounders by controlling for key demographic variables; however, the lack of consideration of additional confounders means that other variables (such as anxiety) could have accounted for these differences.

A number of analogue studies investigating the relationship between metacognitive beliefs and paranoia using the MCQ have also been reported in the past decade. Using a French version of the MCQ-65, Laroi and Van der Linden (2005) found that positive beliefs about worry and negative beliefs about the uncontrollability of thoughts and corresponding danger were the best predictors of the suspiciousness and persecutory ideas component of the PDI-21 ($\beta = 0.16$; $p < .005$ and $\beta = 0.24$; $p < .001$ respectively). The results from this study are in contrast to studies that took into account the influence of confounding variables. For example, Garcia-Montes et al. (2005) used a Spanish version of the MCQ-65 in an undergraduate sample (n = 148), and found the uncontrollability and danger, loss of cognitive confidence and positive beliefs about worry subscales predicted paranoia scores (PS). However, the only metacognitive variables that showed a statistically significant relationship with paranoia, after taking into account the effect of anxiety, were positive beliefs about worry ($r = .18$, $p < .05$) and loss of cognitive confidence ($r = .25$, $p < .01$). Moreover, the only MCQ subscale to predict paranoia (when controlling for anxiety levels) was the loss of cognitive confidence subscale ($\beta = 0.25$, $R^2 = 0.27$; p value not provided).

More recently, Varese et al. (2011) investigated the association between metacognitive beliefs (MCQ) and the persecution subscale of the PADS while controlling for the effects of cognitive intrusions with anxious and depressive content and hallucination-proneness. In contrast to the previous study (Garcia-Montes et al., 2005), negative beliefs about the uncontrollability of thoughts and associated danger ($sr^2 = .007$, $p < .05$) reliably predicted paranoia scores (n = 388). Moreover, paranoia-proneness was also predicted by the positive beliefs about worry ($sr^2 = .017$, $p < .01$), and beliefs about the importance of controlling thoughts ($sr^2 = .007$, $p < .05$) subscales.

Metacognitive beliefs and paranoia in clinical studies and non-clinical samples using the BAPS

The development of the BAPS enabled researchers to investigate the relationship between metacognitive beliefs and paranoia with greater specificity than the MCQ. These associations have been investigated in both clinical (Morrison et al., 2011) and non-clinical (Gumley et al., 2011; Campbell & Morrison, 2007, Morrison et al., 2005) samples. Using multiple regression analysis, Morrison et al. (2005) showed that the beliefs about paranoia as a survival strategy and negative beliefs about paranoia subscales of the BAPS predicted the experience of paranoia ($r = 0.15$, $p < .005$) in a large sample of undergraduate students ($n = 317$). Moreover, this study found that negative beliefs about paranoia was the only BAPS subscale to make a significant contribution to the distress associated with delusional ideation ($r = 0.19$, $p < .005$); however, their specific contribution to paranoia related distress was not investigated. As such, conclusions about the specific association between metacognitive beliefs and paranoia cannot be drawn from these findings.

In a similar study, Campbell and Morrison (2007) also found that survival, positive and normalising beliefs were predictive of paranoid thoughts (PS) in a large sample ($n = 373$) of secondary school students. The authors investigated this relationship further using multiple regression analysis and found that the positive ($r = 0.342$, $p < .001$) and survival ($r = 0.516$, $p < .001$) subscales significantly predicted predisposition to paranoia. This study did not explore the association between negative beliefs and paranoia and/or paranoia related distress. The results of the above two studies should be interpreted with caution as the lack of controlling for variables such as gender, age and anxiety in the analysis could have influenced the results.

Controlling for key demographic variables (i.e. age and gender) and a number of additional confounds such as self-consciousness and levels of anxiety and depression, Gumley and colleagues (2011) found partial support for the association between positive beliefs about paranoia as a survival strategy and paranoia frequency (PS), with negative beliefs about paranoia predicting a larger portion of the variance ($r = 0.399$, $p < .001$). The authors modified the PS by adding a scale to measure distress and explored the hypothesis that negative beliefs about paranoid thoughts would be associated with paranoia distress. This hypothesis gained substantial support with negative beliefs accounting for 30.9% of the variance ($r = 0.338$, $p < .001$). This is the only study to directly test and find support for the contribution of negative

beliefs to paranoia related distress. It should be noted, however, that the use of an analogue sample may limit the generalisability of findings to clinical populations.

Finally, a clinical study by Morrison et al. (2011) used the short form version of the BAPS questionnaire and the PANSS item to assess the presence of suspiciousness/ persecution (P6). It found a significant positive association between positive beliefs about paranoia and severity of suspiciousness (r = 0.382, p < .005, n = 60). The specificity of this finding was examined by assessing the correlations between the negative and normalising beliefs and the P6, which were found to be non-significant (r = 0.194, p = .138; r = .214, p = .100, respectively). Moreover, group comparisons between the individuals with a diagnosis of schizophrenia plus problematic persecutory delusions versus those without problematic persecutory delusions revealed that the group meeting criteria for persecutory delusions scored significantly higher on the negative beliefs about paranoia subscale than the group without such delusions (t = 4.91; p = .001). Negative beliefs about paranoia (as well as age and gender) also significantly predicted patient status (odds ratio = 0.20; p < .001). Although these two groups had an unequal sample size, group comparisons between persecutory individuals and non-persecutory individuals with identical diagnoses adds to the strength of evidence. However, the generalisability of these findings may be compromised due to the use of a relatively older, convenience sample. Finally, although the authors controlled for age and gender, the effect of important confounds such as anxiety and/or depression was not taken into account, which limits the conclusions that can be drawn for the association between factors.

Discussion

Summary of findings

This systematic review sought to investigate the applicability of the metacognitive model to explain the occurrence of paranoia by identifying, summarising and critically evaluating studies that have investigated the association between metacognitive beliefs and clinical and non-clinical paranoia. In total, ten studies were identified that satisfied inclusion criteria for the review. Overall, there is evidence to support an association between metacognitive beliefs and paranoia. Of the clinical studies using the MCQ, all three (Morrison & Wells, 2003; Fraser et al., 2006;

Valiente et al., 2012) demonstrated that individuals with persecutory delusions scored significantly higher than non-clinical controls on the uncontrollability and danger subscale. In addition, two studies (Morrison & Wells, 2003; Fraser et al., 2006) found consistent results for the cognitive confidence subscale with the persecutory group scoring higher than controls. The differences were less clear between individuals with persecutory beliefs and panic. One study (Morrison & Wells, 2003) found that the group with persecutory beliefs scored higher on cognitive confidence whereas another found this difference to be significant only for the positive beliefs about worry subscale (Fraser et. al., 2006). Finally, no differences on metacognitive beliefs were noted between individuals with persecutory ideas and those with depression or those who hear voices. All the non-clinical studies using the MCQ reported that positive beliefs about worry and negative beliefs about the uncontrollability of thoughts and corresponding danger predicted the presence of paranoia with one of the studies (Garcia-Montes et al., 2005) showing that the only subscale to remain significant after controlling for anxiety were the positive beliefs about worry and cognitive confidence subscales. The MCQ was developed to assess several dimensions of metacognition such as beliefs, judgments and monitoring tendencies thought to be relevant to the S-REF model of psychological problems (Wells & Cartwright-Hatton, 2004). The above studies showed that individuals with clinical and non-clinical paranoia have more worries about the control and dangerousness of their thoughts and positive beliefs about worry, and show less confidence in their attention and memory. These results are consistent with the S-REF, which proposes that the use of worrying, as a means of coping with threat, is driven by positive metacognitive beliefs and that psychopathology and distress arise in response to the development of negative beliefs about the process of worrying itself (Wells, 2007). These findings are also in line with previous research outcomes that implicate worry in the occurrence and maintenance of paranoia (Startup, Freeman, & Garety, 2007; Freeman et al., 2008) and delusional distress (Garety & Freeman, 1999).

Although studies using the MCQ have informed our understanding of the application of metacognition in paranoia, it should be noted that the MCQ applies principles of the S-REF to thinking in general. The BAPS on the other hand, applies S-REF principles specific to paranoid thinking and therefore, its use has led to a more detailed investigation of a metacognitive approach to paranoia. Of the four studies investigating the role of survival beliefs and negative beliefs in paranoia using the

BAPS, three found evidence in support of the associations between positive beliefs and paranoia (Morrison et al., 2005; Campbell & Morrison, 2007; Morrison et al., 2011) and between negative beliefs and paranoia (Morrison et al., 2005; Gumley et al., 2011; Morrison et al., 2011). These associations remained significant even when the impact of demographic and other variables, such as anxiety and depression, on paranoia were considered (Gumley et al., 2011). Moreover, this study also provided support for an association between negative beliefs and distress associated with paranoia specifically. Overall, results from the majority of studies using the BAPS showed that positive beliefs about paranoia were associated with paranoia severity, while negative beliefs about paranoia were associated with paranoia and delusional related distress, more problematic delusions and patient status. These results are consistent with the S-REF model and provide tentative support for the metacognitive model of paranoia. Finally, taken together results from all ten studies, suggest that there are clear associations across both positive and negative beliefs relevant to the occurrence of paranoia and the distress associated with it.

Methodological limitations of studies reviewed

The quality assessment highlighted a number of methodological considerations. The majority of studies were rated as 'moderate' or 'weak' on the representativeness of their samples, study design, and lack of control over confounding variables. All of the studies relied on self-referral and it was not made clear whether all suitable participants had been approached. The sample across all studies was predominantly female, which further limits the generalisabilty of findings. In addition, there was a large difference in mean age between the clinical (38.07 years) and non-clinical (20.92 years) samples. Moreover, the tendency to ignore the multi-dimensional nature of paranoia by providing data on levels of frequency and distress makes the comparison across studies and interpretation of results difficult (Freeman, 2007). Studies providing information on the frequency of paranoid ideation and associated distress may enable researchers to develop a clearer understanding of the role of metacognitive beliefs at different stages in the development of paranoia. Furthermore, research investigating the application of a metacognitive model in paranoia may benefit by making use of measures such as the BAPS.

All of the studies included in this review implemented a correlational or cross-sectional design, which prevents inferences of causality between variables. Elevated metacognitive beliefs in individuals with persecutory beliefs may be simply a consequence of paranoia experiences and thus a maintaining, rather than an aetiological, factor. Secondly, with the exception of two studies (Morrison & Wells, 2003; Morrison et al., 2011), results from the comparison studies are drawn from groups of individuals without comparable diagnoses such as panic disorder and depression. This means that the groups may have differed on a number of variables other than paranoia-proneness. Freeman et al. (2003) have demonstrated that anxiety is predictive of the occurrence of paranoid thoughts. Moreover, there is also evidence that increased depression is associated with more frequent paranoid thoughts (Green et al., 2008). Therefore, not measuring and controlling for variables such as anxiety and depression - a limitation identified in the majority of studies reviewed - may have led to inflated estimates of the association between metacognitive beliefs and paranoia. Finally, the generalisation of findings from analogue studies to the clinical population is limited.

Limitations of the current review

This review has a number of limitations. First, it did not assess the impact of publication bias; this could have been addressed by including unpublished data, though such studies tend to be of poor methodological quality and were an exclusion criterion in the current review. Secondly, limiting the inclusion of studies to those written in English may have excluded important papers that reported data regarding the association between metacognitive beliefs and paranoia. Moreover, this review focused on studies that assessed metacognitive factors using the MCQ and BAPS. Excluding studies using non-standardised measures of metacognitive beliefs meant that the likelihood of detection biased was reduced. However, any conclusions do not generalise to other metacognitive constructs (such as self-consciousness) that might also be implicated in the experience of paranoia. This review could have benefited by implementation of meta-analytic methods to evaluate the validity and specificity of the mechanisms considered; however, this was not possible due to insufficient data from reports and the inclusion of studies with a broad range of designs.

Clinical implications and future research

Despite the limitations presented above, the results from this review offer some support for the role of metacognitive beliefs in clinical and non-clinical paranoia and tentative support to the metacognitive model of paranoia. The identification of metacognitive beliefs in clinical and non-clinical paranoia supports the continuum hypothesis (Bentall, Jackson & Pilgrim, 1988; Freeman et al., 2005; Johns & van Os, 2000). Therefore, conducting research to identify metacognitive processes involved in non-clinical paranoia will enable the understanding of variables involved in clinical paranoia.

This review has highlighted a number of methodological implications for research studies that might attempt to establish a causal role of metacognitive beliefs in the development and maintenance of paranoia. Firstly, studies need to incorporate recruitment strategies that aim to reduce recruitment bias and provide more information on the representativeness of their sample. For meaningful comparison of metacognitive beliefs across studies, researchers should also consider reporting levels of paranoia conviction, preoccupation and distress (Freeman, 2007). Moreover, exploration of the role of metacognitive factors in paranoia will be aided by the use of specific measures and the field will also benefit by continued development of measures of metacognition in paranoia. Varese and Bentall (2011) proposed that studies should implement rigorous measures to account for the effects of confounds as far as is possible. These authors based this suggestion on the rationale that the metacognitive factors of the MCQ are associated with anxiety (Gwilliam, Wells & Cartwright-Hatton, 2004) and depression (Wells & Carter, 2002) and further explained that investigating whether the elevation in metacognitive beliefs is related to the experience of paranoia rather than anxiety and depression is crucial. However, findings that psychotic experiences and affective symptoms co-occur (Loewy, Johnson, & Cannon, 2007; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009), as well as that psychotic experiences are often reported by individuals with both affective and anxiety disorders (Varghese et al., 2009) and that the persistence of psychotic experiences is linked with increased levels of affective symptoms (van Rossum, Dominguez, Lieb, Wittchen, & van Os, 2011) may contraindicate partialling out the effects of anxiety and depression.

The results of this review have important clinical implications. The evidence from previous studies on the association between metacognitive beliefs in paranoia

has encouraged researchers to consider potential clinical applications of the metacognitive beliefs model (Morrison et al., 2005; Morrison et al., 2011; Gumley et al., 2011). Specifically, researchers have argued that if metacognitive beliefs about paranoia have a causal role in the development of paranoia, an assessment of positive and negative metacognitive beliefs may be considered. This can be achieved by the use of rating scales (such as the MCQ or BAPS) or employing an advantages/disadvantages analysis. Where positive and negative beliefs about paranoia are identified proponents of this model have suggested that they are modified using metacognitive therapy strategies (Wells, 2002; 2011). For example, if an individual has had life experiences that have led to him viewing paranoia as a survival strategy then a functional alternative should be considered. Where negative beliefs about paranoia are identified providing individuals with normalising information regarding the common nature of paranoia and reducing negative stereotypes and stigma (Pyle & Morrison, 2014; Wood, Birtel, Alsawy, Pyle, & Morrison, 2014) to challenge such beliefs will assist in reducing distress (Morrison et al., 2003).

Based on the current evidence, it is important to consider that therapeutic interventions that focus on metacognitive belief change will not necessarily lead to a decrease in the frequency of paranoia. Moreover, some individuals cope well with paranoia experiences and targeting the distress associated with such experiences may be more important for them (Varese & Bentall, 2011). Indeed, the relationship between negative metacognitive beliefs and distress associated with the experience of paranoia warrants more attention.

As the literature stands, the methodological design studies have employed does not permit conclusions with regards to the causal role of metacognitive beliefs in the development of paranoia, thus providing limited support for the metacognitive model of paranoia. Research investigating the causal role of metacognitive beliefs in paranoia would benefit from longitudinal studies that investigate the evolution of metacognitive beliefs in individuals with ‘at risk’ mental states as well as from studies that involve the experimental manipulation of metacognitive beliefs in paranoia.

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Paper Two: Empirical study

Title

Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population

Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population

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Abstract

Aims: Previous studies have investigated the applicability of the metacognitive model of paranoia to explain the occurrence of paranoia, by exploring associations between paranoia and metacognitive beliefs, and have found some tentative support. In the absence of causal conclusions, the present study assessed the direct impact of manipulating positive and negative metacognitive beliefs on paranoia frequency and distress.

Methods: A non-clinical sample (n = 110) was randomly assigned to either a positive or negative manipulation group intended to alter beliefs about paranoia before entering a paranoia induction task. In the positive beliefs group, participants were exposed to information about the benefits of paranoia. In the negative beliefs group, participants were exposed to information about the dangerous and harmful effects of paranoia. Participants completed measures of paranoia, metacognition and affective states before and after the experimental conditions.

Results: Only the positive beliefs induction was successful in manipulating metacognitive beliefs. After the paranoia induction, the positive group reported an increase in paranoia frequency. Participants in the negative beliefs group reported a decrease in paranoia related distress.

Conclusions: This study aimed to explore the causal role of metacognitive beliefs in the development of paranoia. Clinical implications and suggestions for future research are discussed.

Keywords: paranoia; metacognition; suspiciousness; analogue

Introduction

The term paranoia is often used to describe thinking in which a person holds the 'unfounded belief that harm is occurring or is going to occur to him or her' (Freeman & Garety, 2000, p. 427). As a broad term, paranoia encompasses experiences ranging from everyday suspicions about the intentions of others to persecutory delusions. Persecutory delusions are thought to represent the extreme end of the paranoia spectrum (Freeman & Garety, 2014) and have been identified as a hallmark symptom of psychosis (Freeman & Garety, 2006). They have been identified as the most likely type of delusion to be acted on (Wessely et al., 1993) and can have a debilitating effect on people's lives (Freeman et al., 2014).

Survey research conducted by Ellett, Lopes, and Chadwick (2003) found paranoid-type cognitions were prevalent in a large student sample (n = 153). Similarly, Freeman et al. (2005) found that paranoid thoughts are a weekly occurrence for many people. Consistent with this view, research using analogue student samples to study non-clinical paranoid experiences has utility in informing the understanding of the processes and mechanisms underlying persecutory delusions (Freeman et al., 2005). The use of paranoia induction paradigms has been particularly popular among researchers experimentally investigating the role of causal factors in non-clinical paranoia (Freeman, 2008; Kesting & Lincoln, 2003; Lincoln, Peter, Schäfer, & Moritz, 2009).

Wells and Matthews' (1996; 2014) Self-Referent Executive Function (S-REF) model provides a useful framework for understanding vulnerability to paranoia. This model suggests that psychological difficulties and their maintenance are associated with a style of thinking called the Cognitive-Attentional Syndrome (CAS). This syndrome is characterised by perseverative thinking in the form of rumination, worry, self-focused attention, threat monitoring, and coping behaviours that fail to challenge negative beliefs (Wells, 2007). The CAS is controlled by underlying beliefs about thinking or metacognitive beliefs that fall under two broad categories: positive and negative beliefs. This theory predicts that positive beliefs about mental events will be associated with an increase in frequency about such events, whereas negative beliefs about internal experiences will be associated with an increase in distress.

Experimental studies in paranoia have provided support for the role of worry (Freeman et al., 2008), rumination (Martinelli, Cavanagh, & Dudley, 2013) and self-

focused attention (Flower, Newman-Taylor, & Stopa, 2015) as predictors of the occurrence of non-clinical paranoia. The role of metacognitive beliefs in paranoia has been investigated in cross-sectional studies using clinical (Fraser, Morrison, & Wells, 2006; Morrison & Wells, 2003; Morrison et al., 2011; Valiente, Prados, Gómez, & Fuentenebro, 2012) and non-clinical samples (Campbell & Morison, 2007; García-Montes, Cangas, Pérez-Álvarez, Hidalgo, & Gutiérrez, 2005; Gumley, Gillan, Morrison, & Schwannauer, 2011; Larøi & Van der Linden, 2005; Morrison et al., 2005; Varese, Barkus, & Bentall, 2011), with evidence providing support for an association between the two variables. However, cross-sectional design studies prevent inference of causality; therefore, causative investigations of metacognitive processes in paranoia are needed. If metacognitive beliefs about paranoia have a causal role in the development of paranoia, then a number of clinical implications for the assessment and management of paranoia should be considered. For example, if an assessment identifies that an individual has had life experiences that have led to viewing paranoia as a survival strategy (i.e. a positive belief about paranoia), then a functional alternative should be considered. Where negative beliefs about paranoia are identified, providing individuals with normalizing information regarding the common nature of paranoia and reducing negative stereotypes and stigma (Pyle & Morrison, 2014; Wood, Birtel, Alsawy, Pyle, & Morrison, 2014) to challenge such beliefs will assist in reducing distress (Morrison, Renton, Dunn, Williams, & Bentall, 2003).

Therefore, the present study aims to explore the causal role of metacognitive beliefs on paranoia frequency and distress by utilising an experimental design. We combine methodologies from research on the provision of recordings to challenge appraisals in the general population (French et al., 2011) with a paranoia induction paradigm (Williams, Cheung, & Choi, 2000). To our knowledge this is the first study to experimentally investigate the role of metacognitive beliefs on paranoia. Our main aim is to explore whether experimentally manipulating appraisals about paranoia leads to an increase in paranoid thinking and distress associated with paranoia following a paranoia induction task. Specifically, we hypothesise that there will be a significant interaction between time (within-subjects with two levels: baseline and outcome) and group (between-subjects variable with two levels: positive and negative) for paranoia frequency, such that the positive beliefs about paranoia group (PBPG) will show an increase in paranoia frequency (Hypothesis 1). Similarly, we hypothesised that there will be a significant interaction between time (within-subjects

with two levels: baseline and outcome) and group (between-subjects variable two levels: positive and negative) for paranoia distress, such that the negative beliefs about paranoia group (NBPG) will show an increase in paranoia-related distress (Hypothesis 2).

Methods

Participants

A power calculation was carried out, based on comparing between-subject means between two groups using a two-sample t-test at the conventional two-sided 5% significance level (alpha 0.05). The sample size calculations were performed using nQuery Advisor 7.0. Drawing on previous studies of non-clinical paranoia (Freeman et al. 2005), it was estimated that with 55 participants in each group (110 total participants) this study would have 80% power to detect effect sizes of at least 0.566 between both groups.

An opportunistic analogue sample of students and staff was recruited. The study was advertised as a study about suspiciousness, emotions and task performance (see Appendix B). Inclusion criteria were: aged 18 years or older, English speaking, normal or corrected vision and hearing, and no current or past involvement with secondary care psychiatric services. Participants who contacted the researcher were provided with the study information sheet via email or hard copy and were given a minimum 24-hour period to consider participation in the study (Appendix C). Participants with a history of severe mental health problems (e.g. schizophrenia, bipolar disorder, affective psychosis), and taking psychiatric medication were excluded. Eligible participants were awarded credits for their study at the University or cash reimbursement.

Measures and Materials

Trait Paranoia

Green et al. Paranoid Thoughts Scale Part B (GPTS; Green et al., 2008). This is a 16-item trait measure focusing on paranoid thinking consistent with Freeman and Garety's (2000) criteria. Each of the items is measured on a 5-point scale, giving a potential total of 80, with higher scores indicating greater levels of persecutory

thinking. The measure has been reported to have good internal consistency, reliability and validity in clinical and non-clinical populations (Green et al., 2008). In the current study, Cronbach's α for this scale was .91, indicating excellent internal consistency.

State paranoia

Paranoia Checklist (Freeman et al., 2005). This is an 18-item measure designed to investigate paranoid thoughts; it provides a multi-dimensional assessment of paranoid ideation. Each item is rated on a 5-point scale for frequency, degree of conviction and distress. The measure has shown good internal consistency and convergent validity (Freeman et al., 2005). For the current sample, Cronbach's α for frequency and distress, the subscales used in the current study and completed at time 1, were .87 and .91 respectively, indicating good internal consistency.

Metacognitive beliefs

Beliefs about Paranoia Scale – Short form (Gumley, Gillan, Morrison, & Schwannauer, 2011). This is an 18-item self-report measure developed to assess metacognitive processes involved in paranoia and consists of three subscales: survival, normalising, and negative beliefs about paranoia. Each subscale consists of six items and each item is rated on a 4-point scale to measure conviction. The measure has previously demonstrated good internal consistency (Morrison et al., 2011). In the current study, Cronbach's α was .92 for the positive subscale and .89 for the negative subscale, suggesting good internal consistency for both sub-scales.

Emotional processes

Depression Anxiety Stress Scales (Lovibond & Lovibond, 1995). This is a 42-item instrument with three subscales measuring current symptoms of depression, anxiety and stress. Only the anxiety and depression sub-scales were used in the current study. Each subscale consists of 14 items and items are rated on a 4-point scale, with higher scores indicating higher levels of emotional distress. The scales have been shown to be reliable and valid (Brown et al., 1997; Crawford & Henry, 2003; Page et al., 2007). For the current sample, this measure demonstrated very good internal consistency, reflected by a Cronbach's α of .95 for the depression subscale and .88 for the anxiety subscale.

Metacognition induction

Tasks of beliefs about paranoia manipulation were unavailable. Therefore, a novel paradigm was developed to manipulate positive and negative beliefs about paranoia for the purposes of this study. These were developed in line with pre-existing tasks used with similar populations such as that used by French et al. (2011). The present paradigm consisted of two audio recordings that were developed in discussion with a senior NHS researcher and clinician and the research team. Participants in the positive condition received information about the benefits of paranoia whilst participants in the PBPG received information about the dangerous and harmful effects of paranoia. The positive recording was eight minutes and the negative recording six minutes long (Appendix D for recording scripts). Participants listened to the audio material using headphones in a quiet research cubicle.

Manipulation check

Following the metacognitive beliefs manipulation, a state version of the highest loading items on positive/ survival beliefs ('It is important to be paranoid' and 'It is safer to be paranoid') and negative beliefs ('My paranoia distresses me' and 'My paranoia thoughts worry me') from the BAPS were re-administered and served as a manipulation check questionnaire (Gumley et al., 2011). The state-adapted instruction was, 'How strongly do the following thoughts apply to you *at the moment?'*

Paranoia induction

Following the manipulation check, all participants entered the paranoia induction stage. Paranoia was induced using the Cyberball task (Kesting, Bredenpohl, Klenke, Westermann, & Lincoln, 2013; Williams, Cheung & Choi, 2000). This is a well-established experimental paradigm that has been found to evoke feelings of social exclusion assumed to be predominant in paranoia (Kesting et al., 2013). The Cyberball 4.0 program was saved on the University's web server and run using HTML5.

Procedure and design

The experiment was a randomized repeated-measures design with two groups: a within-subjects factor with two levels (time: time 1 and time 3), and a between-subjects factor with two levels (Group: PBPG and NBPG). On arrival, participants

provided informed consent (Appendix E) and were advised that they could discontinue the experiment at any time. Participants were randomized to the PBPG or NBPG using their total score on the PTS B scale as a stratification factor. A cut-off (<22.1) was pre-specified and chosen based on data provided by Green et al. (2008). An independent statistician generated a randomisation list with 140 participants to ensure that 70 participants were randomised to each group and within each group 35 with high level and 35 with low-level paranoia were included. More participants scored below 22.1 on the PTS B. Therefore, a second randomization list was requested. To ensure that randomisation was blinded, the list was sent to a researcher independent to the study that used the list to make the randomisation envelopes.

At baseline, participants were assessed for metacognitive beliefs, state paranoia, and anxiety and depression (see Appendix F for measures). Participants in the PBPG were exposed to the 'positive' recording and participants in NBPG were exposed to the 'negative' recording. Following the belief manipulation and manipulations check, all participants entered the paranoia induction stage. Finally, participants were reassessed with regard to metacognitions, state paranoia and distress. Study instructions were standardised and provided on Microsoft Powerpoint. Participants were informed at the outset that this was a study about paranoia.

Following testing, the researcher checked participant distress and provided everyone with normalizing information about psychotic-like experiences (French et al., 2011). No one reported experiencing distress at the end of the study (see Appendix G for distress protocol). Participants were followed up with a phone-call within 24-hours and signposted to local services as appropriate. A diagrammatic description of the procedure is presented in Figure 1.

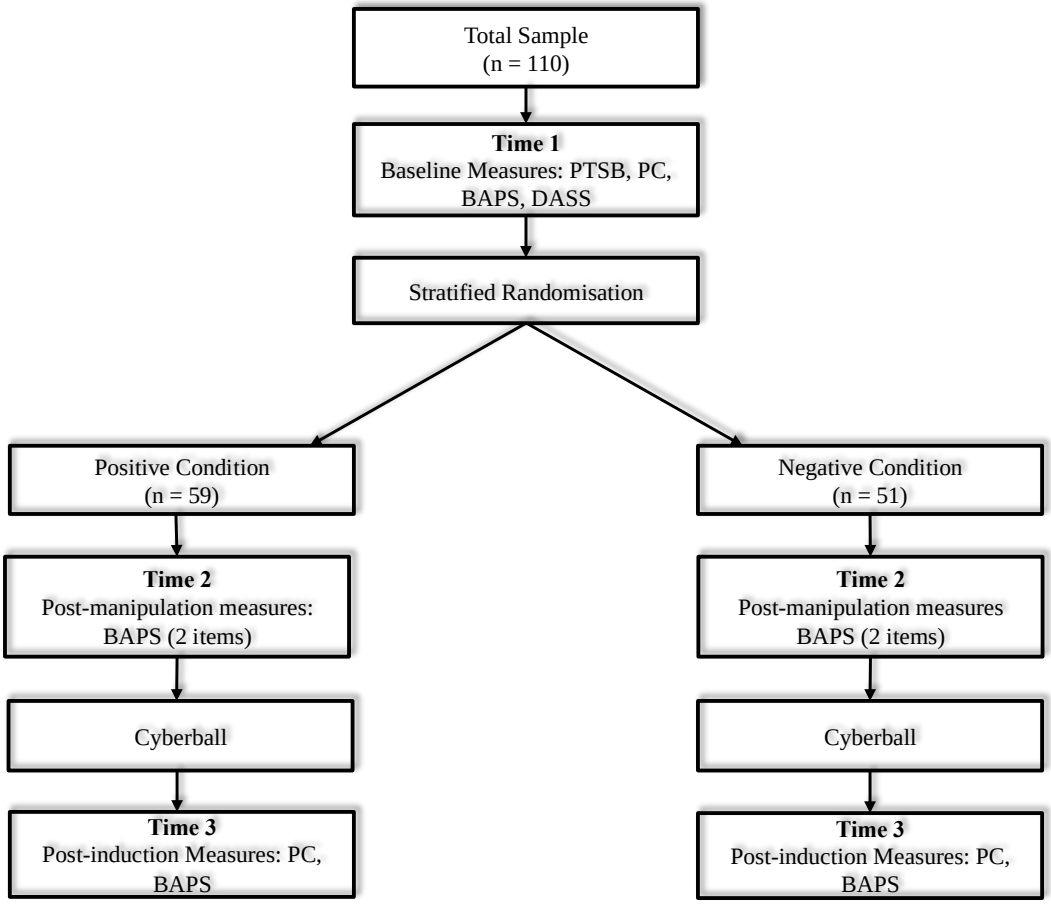

Figure 1. Study procedure

Statistical analysis

The data were analysed using IBM SPSS Statistics version 22. Missing data were pro-rated with the mean for that scale when less than 10% of data was missing. When this limit was exceeded the participant data from the relevant scale was excluded. Variables were assessed for normality via inspection and calculation of histograms, and Q-Q and P-P plots, and calculation and examination of skewness and kurtosis z-scores. This revealed that all variables varied significantly from the normal distribution. Attempts to correct the distributional problems using logarithmic transformations were not successful. As such, the bootstrap function was used where available. Chi-square tests and independent samples t-tests were performed to assess for baseline differences between the two groups (time 1). These tests revealed that the groups were not different with respect to key demographic variables (such as age and gender) and baseline measures. Means/medians and standard deviations/ranges of key variables are presented in Table 1.

Table 1. Distributions of key variables

		Whole Sample			Positive Group			Negative Group		
		Mean/Median	**SD/Range**	**N**	**Mean/Median**	**SD/Range**	**N**	**Mean/Median**	**SD/Range**	**N**
Trait Paranoia GPTS B		21.76/19.00	7.60/40.00	110	21.79/19.00	8.01/40.00	59	21.72/19.00	7.18/29.00	51
State Paranoia PC	Paranoia Frequency	27.00/25.00	7.55/35.00	108	26.82/24.00	8.12/35.00	59	27.22/25.50	6.91/30.00	50
	Paranoia Distress	27.75/24.00	10.47/45.00	108	28.52/25.00	11.23/45.00	59	26.83/23.00	9.50/45.00	49
Affective States DASS	Anxiety	6.51/4.50	6.80/40.00	110	7.45/6.00	7.44/40.00	59	5.43/4.00	5.86/30.00	51
	Depression	7.53/4.50	8.92/40.00	108	8.50/5.00	9.47/40.00	57	6.45/4.00	8.21/34.00	51
Manipulation BAPS	Survival Beliefs	9.11/7.00	4.09/17.00	110	9.22/7.00	4.48/17.00	59	9.00/7.00	3.63/14.00	51
	Negative Beliefs	9.26/8.00	3.74/16.00	110	9.54/8.00	3.80/16.00	59	8.94/8.00	3.56/16.00	51

SD = standard deviation; GPTS B = Green Paranoid Thought Scale B; PC = Paranoia Checklist; DASS = Depressions Anxiety Stress Scales; BAPS = Beliefs about Paranoia Scale

The success of the manipulation (that the PBPG and NBPG scored higher on positive and negative beliefs about paranoia -2 items per subscale- between time 1 and time 2 respectively) was assessed using a paired samples t-test between time 1 and time 2, an independent samples t-test at time 2 on the 2-item BAPS, and a paired samples t-test on the full BAPS (6 items per subscale) between time 1 and time 3.

A repeated measures ANOVA was conducted to test the direct effect of metacognitive beliefs about paranoia on paranoia frequency (time: time 1, time 3) as the within-subject factor and the experimental group (PBPG, NBPG) as the between-subject factor. This analysis was repeated for paranoia distress. In light of the distributional problems and absence of a bootstrap function for ANOVA, the decision to continue with the ANOVA was based on the observation that it yielded almost identical results to two independent samples t-tests (with bootstrapping) on the change scores (paranoia frequency and distress) between time 1 and time 3 (see Appendix H for SPSS output). Mathematically, the test for the time by group interaction from the ANOVA is exactly equivalent to an independent samples t-test on the change score between baseline and outcome (time 1 and time 3). Significant interactions were explored with paired t-tests between time 1 and time 3 and independent samples t-tests at time 3 for both paranoia frequency and distress.

Results

Demographic data

One hundred and ten participants were recruited to the study with the stratified randomisation procedure allocating 51 to the negative and 59 to the positive conditions. This random imbalance occurred due to the randomization lists not being completed. The mean age of the sample was 23 years (*SD* = 4.75, range = 18-35) and comprised 82 females and 28 males. The demographic characteristics of the sample are presented in Table 2.

Table 2. Sample characteristics

		n (%)
Ethnicity	White British	69 (62.7)
	Any Other White background	14 (12.07)
	Mixed	2 (1.8)
	Asian or Asian British	15 (13.6)
	Black or Black British	4 (3.6)
	Chinese or other ethnic group	6 (5.5)
Native Language	English	82 (74.5)
	Non-English	28 (25.5)
Highest education level achieved	GCSE	6 (5.5)
	AS/ A- level	85 (77.3)
	Degree	13 (11.8)
	Postgraduate	6 (5.5)
Current degree	Psychology	71 (64.5)
	Non-psychology/ Staff	39 (35.5)

Manipulation check

Results from the paired samples t-test showed that participants in the PBPG reported an increase in positive beliefs about paranoia (2-item BAPS) from time 1 (M = 2.84, SE = 0.86) to time 2 (M = 4.5, SE = 0.19). This difference (1.62, BCa 95% CI [-1.91, – -1.33]) was significant ($t(58) = -10.16$, $p = .000$) and represented a medium-sized effect ($d = 0.54$). Participants in the NBPG reported an increase in negative beliefs about paranoia (2-item BAPS) from time 1 (M = 2.90, SE = 0.19) to time 2 (M = 2.94, SE = 0.19), but this difference (-0.03, BCa 95% CI [-0.33 – 0.27]) was not significant ($t(50) = - 0.26$, $p = .792$). An independent t-test on the BAPS at time 2 showed that the two groups differed significantly on positive beliefs about paranoia ($t(108) = -5.7$, $p = .000$). The difference on negative beliefs about paranoia between the two groups at time 2 was not significant ($t(108) = - .76$, $p = .445$). Based on the hypothesis derived from the metacognitive model of paranoia (Morrison et al., 2011),

suggesting that a level of paranoia should be present before negative belief activation takes place, the paired t-tests were repeated between time 1 and time 3 for both the positive and negative group using the relevant subscales from the 18-item BAPS. This revealed a small decrease on negative beliefs from time 1 (M = 8.97, SE = 0.52) to time 3 (M = 8.29, SE = 0.49). This difference (0.68, BCa 95% CI [0.29 – 1.12]) was significant ($t(47) = 3.16$, $p = .003$), with a small effect size ($d = 0.17$). Finally, an increase on positive beliefs was noted from time 1 (M = 9.22, SE= 8.20) to time 3 (M = 12.44, SE = 0.64) and this difference (-3.22, BCa 95% CI [-4.02 – -2.47]) was significant ($t(58) = -7.29$, $p = .000$), with a medium effect size ($d = 0.49$). Overall, the metacognitive induction was partially successful; only the positive beliefs induction was successful in manipulating metacognitive beliefs.

Main analyses

Effect of metacognitive manipulation on paranoia frequency

Mean and standard deviation paranoia frequency (PC) scores at Baseline and time 3 are presented in Table 1. The repeated measures ANOVA revealed no main effect for group ($F(1, 106) = 0.734$, $p = .393$, $r = 84.05$) or time ($F(1, 106) = 0.015$, $p = .903$, $r = 0.174$). However, there was a significant group x time interaction ($F(1, 106) = 12.4$, $p = .001$), indicating a direct effect of the metacognitive manipulation on paranoia frequency with a stronger increase in paranoia frequency in the PBPG from time 1 (M = 26.82, SE = 8.12) to time 3 (M = 28.41, SE = 9.51) and a decrease in paranoia frequency in the NBPG from time 1 (M = 27.22, SE = 6.91) to time 3 (M = 25.52, SE = 6.55). This interaction is presented in Figure 2.

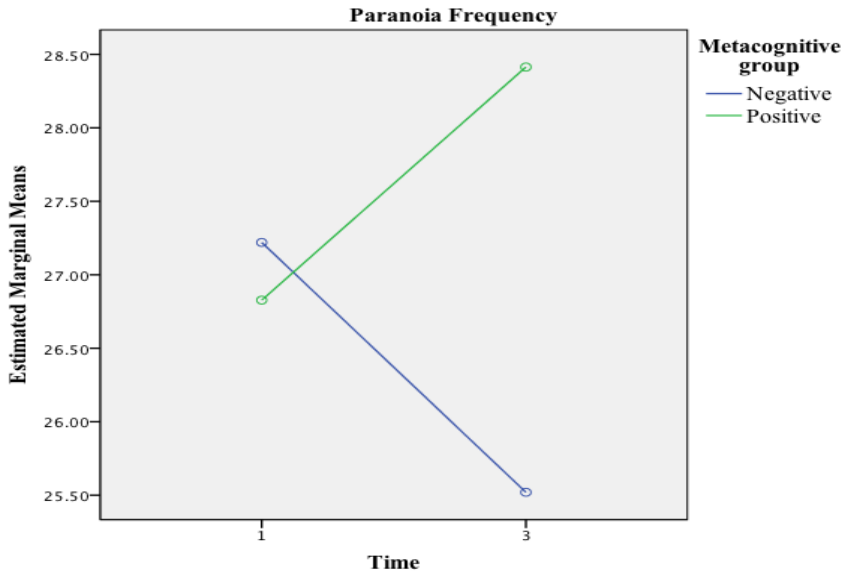

Figure 2. Interaction effect of group and paranoia frequency

A follow-up paired t-test showed that the difference (-1.58, BCa 95% CI [-3.03 – -0.20]) in paranoia frequency for the PBPG from time 1 (M = 26.82, SE = 1.04) to time 3 (M = 28.41, SE = 1.22) was significant ($t(57) = -2.17$, $p = .034$) and represented a small-sized effect ($d = 0.07$). The same test revealed that the difference (1.70, BCa 95% CI [0.70 – 2.84]) in paranoia frequency for the NBPG from time 1 (M = 27.22, SE = 1.01) to time 3 (M = 25.52, SE = 0.95) was significant ($t(49) = 3.14$, $p = .003$), with a small effect size ($d = 0.17$). An independent samples t-test showed that the difference in paranoia frequency at time 3 between the two groups was non-significant ($t(108) = - 1.63$, $p = .10$).

Effect of metacognitive manipulation on paranoia distress

Mean and standard deviation paranoia distress scores at Baseline and time 3 are presented in Table 1. The repeated measures ANOVA revealed no main effect for group ($F(1, 104) = 2.587$ $p = .111$, $r = 566.42$) or time ($F(1, 104) = 0.006$, $p = .936$, $r = 126.04$). There was a significant group x time interaction ($F(1, 104) = 8.21$, $p = .005$), indicating a direct effect of the metacognitive manipulation on paranoia distress with a stronger increase in paranoia distress in the PBPG from time 1 (M = 28.52, SE = 11.23) to time 3 (M = 30.03, SE = 12.99) and a decrease in paranoia distress in the NBPG from time 1 (M = 26.78, SE = 9.62) to time 3 (M = 25.19, SE = 8.06). Figure 3

represents this interaction. A follow-up paired t-test showed that the difference (1.59, BCa 95% CI [0.40 – 2.95]) in paranoia distress for the NBPG from time 1 (M = 26.78, SE = 1.40) to time 3 (M = 25.19, SE = 1.18) was significant ($t(46) = 2.26$, $p = .028$), with a small effect size ($d = 0.09$). The difference (-1.50, BCa 95% CI [-3.10 – 0.016]) in paranoia distress for the PBPG from time 1 (M = 28.52, SE = 1.47) to time 3 (M = 30.03, SE = 1.71) was not significant ($t(58) = -1.91$, $p = .060$). An independent samples t-test showed that the difference on paranoia distress at time 3 between the two groups was significant ($t(105) = - 2.31$, $p = .015$), and the effect size was small ($d = 0.04$).

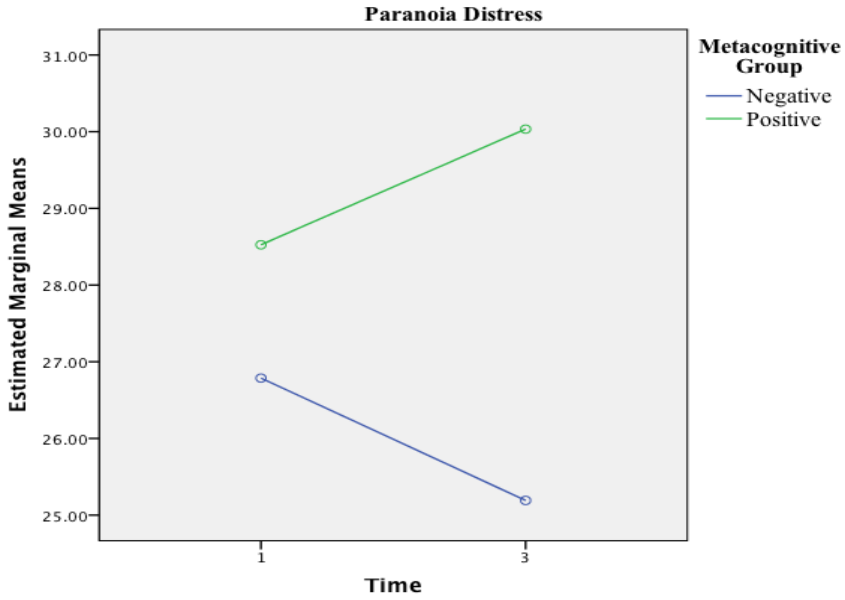

Figure 3. Interaction effect of group and paranoia distress

Discussion

The current study investigated the causal role of metacognitive beliefs on paranoia frequency and distress using a novel experimental design. It was hypothesized that: 1) positive metacognitive belief manipulation would lead to an increase in paranoia frequency; and 2) negative metacognitive belief manipulation would lead to an increase in paranoia related distress. The metacognitive beliefs manipulation was partially successful; the positive group reported an increase in positive beliefs about paranoia following the manipulation; however, the negative group reported a decrease in negative beliefs following the metacognitive beliefs manipulation. In line with predictions, individuals with positive beliefs about paranoia showed an increase in paranoid thoughts (Hypothesis 1). However, the negative group did not report an increase in paranoia distress (Hypothesis 2).

This is the first study to explore the causative role of metacognition in paranoia. The observed causal relationship between positive beliefs and paranoia frequency supports the metacognitive prediction of the S-REF model (Wells & Matthews, 1994) and supports the suggestion that positive beliefs about paranoia, (e.g. 'If I were not paranoid others would take advantage of me') leads to the adoption of paranoia as a deliberate strategy for managing interpersonal threat (Morison et al., 2005). The failure of the negative metacognitive task to cause an increase in negative beliefs means that any potential causal relationship between negative beliefs and paranoia distress could not be determined. The fact that the negative manipulation was not successful might explain the observed decrease in paranoia frequency and distress (time 3) in this group. Moreover, this decrease was observed following a small, but non-significant, increase in negative beliefs (time 2), which might suggest that participants engaged in suppression immediately after exposure to the negative recording. The suppression of the unwanted paranoid thoughts could have led to a delayed rebound effect (Wenzlaff & Wegner, 2000) of paranoid thoughts, which was not assessed.

The finding that positive beliefs increased successfully following a short audio recording suggests that manipulating positive beliefs about paranoia in analogue research to test causal predictions is feasible. The majority of the sample consisted of psychology students (62.7%), with an equal split between the two groups. Psychology students are well versed in current theories of psychosis and the normalizing approach

involved when working with people with psychosis (Morrison et al., 2003). Moreover, this study was conducted in an urban environment where literature shows that the occurrence of paranoia is high (Freeman et al., 2008). As such, it may be possible that the positive recording was successful because its content, although exaggerated, was reinforcing ideas in line with participants existing beliefs about the benefits of paranoia, thereby enabling positive beliefs about paranoia amenable to manipulation. The negative beliefs recording on the other hand could have been perceived as 'far from the truth' and perhaps not credible; thus, increasing the likelihood of demand characteristics and experimental bias (Rosenthal & Rosnow, 2009).

The Cyberball paradigm is well-established (Williams et al., 2000), and has been found to elicit negative emotions such as feelings of social exclusion that are thought to be predominant in paranoia (Preti & Cella, 2010). During a brief pilot to test study procedure, it emerged that first year psychology students had received teaching on Cyberball as part of their social psychology module. Specifically, they were taught that Cyberball is used in research to induce negative mood states such as feelings of exclusion. To manage this problem, participants were instructed to try to immerse themselves in the study as best they could. The fact that study results supported the first hypothesis could imply that the above explanation was effective. However, another explanation might be that knowledge of Cyberball rendered it less effective in eliciting paranoid thinking in both groups. Therefore, the increase in paranoia frequency following the positives beliefs task could have been a direct effect of the positive beliefs manipulation rather than Cyberball. Moreover, a less effective paranoia induction task might help explain the failure of the negative beliefs tasks to lead to an increase in negative beliefs about paranoia. The metacognitive model of paranoia (Morrison et al., 2011) proposes that negative belief activation takes place after the emergence of paranoid thinking. Therefore, the negative beliefs task might have been successful if Cyberball was more effective in eliciting paranoid thinking. This could have been achieved by recruiting a non-psychology student sample that may have increased the likelihood of participants believing that they were playing against another person and not against a computer; which has been found to be essential in eliciting paranoid thinking (Ellett et al., 2012). Although this may have been sufficient, the paradigm of the current study could have been strengthened even

further, using Kesting et al.'s (2012) approach in eliciting paranoia, which incorporated a criticism feedback paradigm in addition to Cyberball.

Strengths of this study include adequate statistical power, randomized allocation and the use of an experimental design; the latter allowed testing of the causal role of metacognitive beliefs in paranoia. However, findings should be considered in light of some limitations. First, as discussed above, the negative beliefs task manipulation was ineffective; however, tasks of metacognitive beliefs manipulation are unavailable. Moreover, the study may have been limited by the use of the Cyberball paradigm to elicit paranoid thinking. Other paradigms may have been more powerful. Finally, the sample was not particularly representative, with regards to gender and education, suggesting the results may not be generalizable to the wider population. However, previous research has found no effect of gender in the frequency of paranoia (Freeman et al., 2005).

The findings from this study indicate that positive beliefs about paranoia are directly involved in the development of paranoia. These findings have important implications for clinical practice. Therefore, targeting positive beliefs about paranoia will likely lead to a decrease in paranoia frequency. Although many individuals with paranoia have life experiences that would understandably promote a paranoid view of the world (Morrison et al., 2011), these experiences in and of themselves will not be inevitably followed by distress and/or clinical status (Johns & van Os, 2001). Therefore, in cases where individuals with positive beliefs about paranoia are troubled by their paranoia experiences, therapists should first of all support them develop and choose an alternative strategy that would serve the same function (for example, to help them feel safe), but without the unwanted consequences (such as social isolation) of paranoia. This could happen in conjunction with helping people explore the context (historical and social) within which their positive beliefs about paranoia may have developed.

Future studies should investigate the possibility of successfully manipulating negative beliefs about paranoia in non-clinical samples. For example, it may be possible that training individuals (actor service-users or even other students) to share negative experiences about their paranoia in 'real time' could be perceived more credibly than hearing researchers discussing their views over audio recordings. Moreover, this process could be facilitated through recruitment of a non-psychology student sample and strengthening the existing paradigm by adding a criticism

component, found to be relevant in the development of paranoia (Kesting & Lincoln, 2013). While research using analogue samples can inform our understanding of clinical paranoia, this experiment needs to be replicated in a clinical sample before any conclusions about metacognitive processes involved in clinical paranoia can be drawn. This research should also assess the application of the BAPS with clinical paranoia and examine its sensitivity to therapeutic change. Follow-up data for delayed effects should be assessed. Finally, additional avenues could involve conducting longitudinal research in sub-clinical and clinical paranoia, assessing and measuring levels of metacognitive (positive and negative), beliefs about paranoia and their prospective influence on the course of symptom development and distress.

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Paper Three: Critical appraisal

Introduction

Persecutory delusions are one of the most frequently occurring types of delusions and the second most common symptom of psychosis (Sartorius et al., 1986). Moreover, they are the most likely type of delusions to be acted upon (Wessely et al., 1993) and their presence predicts admission to hospital (Castle, Phelan, Wessely, & Murray, 1994). Experimental research in this area has led to the development of several theoretical models of persecutory thinking. These models focus on different psychological processes involved in the presence and maintenance of persecutory delusions, which is to be expected given their complex and multi-dimensional nature (Freeman et al., 2005). Cognitive models describe how individuals interpret anomalous events based on their life experiences, and emphasise processes such as attentional and attributional biases, and affective states (Bentall, Corcoran, Howard, Blackwood & Kinderman, 2001; Freeman, Garety, Kuipers, Fowler, Bebbington, 2002; Morrison, 2001). In general, they attempt to account for the occurrence and maintenance of persecutory delusions, and have contributed significantly to our understanding of this important clinical phenomenon (Understanding Psychosis; DCP, 2014) and driven the development of effective treatments (NICE, 2014).

Morrison et al. (2005; 2011) have provided a useful framework for understanding vulnerability to paranoia. This model is based on the Self-Referent Executive Function theory (S-REF; Wells & Matthews, 1996; 2004), which suggests that inflexible and recurrent thinking in response to negative thoughts and feelings, driven by metacognitive beliefs, contributes to the development and maintenance of psychological difficulties (such as paranoia). Although clinical implications from this model have been considered, research has not yet investigated the causal role of metacognitive beliefs in paranoia (Bentall et al., 2001). The current thesis offers an assessment and review of the available evidence relevant to the metacognitive model of paranoia, and presents the first experimental study to test the role of metacognitive beliefs in the development of paranoia, and the distress associated with it.

The present paper will provide a critical appraisal of the research process as a whole. Strengths and limitations will be presented along with clinical implications, and suggestions for future research. The two papers will be discussed separately along with personal reflections.

Systematic Review (Paper One)

Review aim

The main aim of the systematic review was to investigate the relevance of the metacognitive model to explain the occurrence of paranoia. The scoping search identified that studies investigating testable predictions made by this model had focused on examining the association between metacognitive beliefs and paranoia. Although a number (n = 10) of studies investigating the role of metacognitive beliefs were identified, these had not been organized, synthesized and reviewed in a systematic way, and as such, the relevance of metacognitive beliefs to working with people who experience paranoia had not been established.

Why a systematic review?

A systematic review of the literature investigating the association between metacognitive beliefs and paranoia was chosen over other types of reviews such as a narrative review or a meta-analysis for several reasons. First of all, narrative reviews tend to be mainly descriptive, do not involve a systematic search of the literature and are therefore open to considerable bias. Systematic reviews on the other hand aim to collate studies that meet pre-specified inclusion/ exclusion criteria to address a given question (Higgins & Green, 2011) and can therefore provide reliable evidence. Well-conducted meta-analyses also provide reliable evidence; however, results cannot be generalised unless the results of the studies combined are consistent and/or homogenous (Higgins, Thompson, Deeks & Altman, 2003). The studies that met the pre-specified criteria agreed for this review included a range of designs, employed clinical and analogues samples, used different measures of metacognition and were thus, not considered by the research team to be 'combinable'. Systematic reviews, however, are not affected by heterogeneity and can bring together studies that are diverse clinically as well as methodologically. Therefore, after careful consideration a systematic review was deemed appropriate for the data available.

Search terms and inclusion criteria

Terms and inclusion criteria were identified through exploration of other reviews, current literature, and discussions within the research team. In developing the list of search terms and inclusion criteria there were two primary considerations: the issue of deciding whether the review should include studies using analogue samples, and the types of dimensions/ aspects of metacognition to include. The first issue has been addressed in the main body of the review and will not be reconsidered here. The process of deciding which facets of metacognition to include in a review examining the role of metacognitive beliefs was informed by metacognitive theory and a similar review in the area. Specifically, Varese and Bentall's (2011) review on metacognitive beliefs in hallucinations included studies that assessed metacognition using the Metacognitions Questionnaire (MCQ; Wells & Cartwright-Hatton, 2004) and the Private Self-Consciousness Scale (PSCS; Feningstein & Vanable, 1992). The PSCS has been used in studies to investigate the role of self-focused attention (SFA) in paranoia. Self-focus attention has been shown to be implicated in paranoia (Feningstein & Vanable, 1992; Freeman et al., 2013) and contribute to the distress associated with it (Taylor & Stopa; 2012). However, self-focus is a marker for the CAS and thus, a metacognitive process (Wells, 2007). Therefore, the PSCS assesses metacognitive *awareness* not metacognitive *beliefs*. Moreover, the PSCS apart from containing some items that can be defined as 'metacognitive' in nature (e.g., 'I am aware of the way my mind works when I work through a problem') also contains items not relevant to metacognition. It was therefore decided that studies using the PSCS would not be included in the current review. The MCQ was included in its entirety because although it measures both metacognitive beliefs and metacognitive processes (e.g., Cognitive Self Consciousness and Cognitive Confidence), it has been derived directly from the S-REF model. The data on metacognitive processes was still synthesized and reported, though the focus was placed on the role of metacognitive beliefs and their implication in paranoia throughout the review.

During the early scoping searches it became apparent that metacognition as a multi-faceted construct is often used in research to refer to mentalisation. Specifically, a large number of studies identified had assessed metacognition in individuals with psychosis using the Metacognition Assessment Scale (MAS; Semerari et al., 2003). This scale, which incorporates subscales such as 'understanding of others' thoughts' and 'awareness of others', has not been developed to assess metacognitive parameters

relevant to psychopathology as conceptualised in the S-REF and as a result, studies including this scale were excluded from the current review.

Quality assessment process

One of the advantages of systematic reviews is that in assessing the methodological quality of the included studies using standardised tools, a critical and less biased appraisal of the findings can be presented. The process of reviewing potential quality assessment tools identified that there was no appropriate valid and reliable measure which could be used for non-intervention studies, which make up the majority of papers included in this review. Based on a previous review of quality assessment tools (Deeks et al., 2003), the Effective Public Health Practice tool (EPHPP; Thomas, Ciliska, Dobbins, & Micucci, 2004) was selected as one that could offer a valid (Thomas et al., 2004), reliable (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012) and flexible appraisal of varying study designs. One of the disadvantages of this tool, however, is that inadequacies in reporting rather than in the methodology of studies can lead to lower EPHPP ratings. There is evidence to suggest that failure to report does not reflect poor methodology (Soares et al., 2004), and therefore the tool may not accurately assess the quality of the research conducted. This was managed by utilizing the flexibility of this tool, and 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). However, as reported earlier, a more suitable tool has yet to be developed.

Future reviews

The findings and limitations identified suggest avenues for future reviews. Reviews investigating metacognition in paranoia could benefit by providing a specific definition of metacognition and describing the theoretical framework within which metacognition is explored. This should then guide the development of inclusion/ exclusion criteria and the selection of assessment scales relevant to the facets of metacognition defined. Moreover, reviews interested in the investigation of metacognitive awareness may benefit from focusing on studies that have assessed this construct using the MCQ; the S-REF was the first model to implicate the role of metacognitive beliefs in psychopathology and the MCQ has derived directly from it. Therefore, the CSC subscale of the MCQ may be considered a purer and more

specific measure of the process of metacognitive awareness, and a better measure of this construct than the PSCS (Wells & Cartwright-Hatton, 2004). Reviews focussed solely on this subscale may therefore present a more accurate picture of the available evidence.

Experimental Paper (Paper Two)

Peer review and ethical approval

The study outlined in paper 2 was presented to the Clinical Psychology doctorate (ClinPsyD) Research subcommittee on 7th October 2013. The panel consisted of a group of academics attached to the Manchester clinical psychology training program, a trainee representative and a service user consultant. The meeting involved discussion of a research proposal (Appendix I). The panel made a number of recommendations (e.g. inclusion of a control group, use of stratified randomisation and the screening and exclusion of individuals at high risk of paranoia), which were addressed in two response letters and a revised proposal (Appendix J). In the revised design the randomisation was stratified by trait paranoia and original sample (n = 100) increased by 10%. Given the robust associations between affective states and paranoia (Freeman, 2007) consideration was given to the confounding effects of anxiety and depression. However, although the application of stratified randomisation is simple, it can become complicated to implement if many variables are involved. Therefore, it was assumed that randomisation would balance anxiety ($t(106) = -1.38$, $p < .171$) and depression ($t(106) = -1.19$, $p < .233$) levels between the two groups, which was supported by the findings. Following these amendments, the study was approved by the research subcommittee (Appendix K) as meeting criteria for submission to the University of Manchester Research Ethics Committee. The Research Ethics Committee reviewed the proposal and application form (Appendix L), and requested some minor amendments including that a follow up telephone call 24-hours after participation to check levels of distress. No participants reported feeling distressed as a direct result of the study tasks, suggesting that manipulation of metacognitive beliefs using audio recordings and Cyberball are safe and promising methods in the study of non-clinical paranoia.

Public involvement

The aim of public involvement is to improve the quality and feasibility of research. Public involvement was sought through the School of Psychological Sciences Community Liaison Group (CLG) at the University of Manchester. This is a group of service users who contribute to all aspects of clinical psychology training, including research projects. Trainees can submit their research proposals to the group for review prior to approval. The experimental study (paper 2) was presented to the group, and a discussion was held regarding the recruitment of a group of people with persecutory delusions. The ethics of inducing paranoia to a group of people already experiencing paranoia and distress were considered. Although the author had not come across any reports in the literature of unwanted and/or harmful side effects associated with paranoia induction paradigms, it was agreed that the study limits itself to use of an analogue sample. Moreover, it was agreed that the researcher should adhere to a robust distress protocol.

Recruitment

The trainee recruited to target. The process of recruitment included a number of methods. For example, the study was advertised using posters, which were placed around the campus and in halls and via the intranet. Moreover, the study was registered with a credit scheme web system available to psychology students, which rewards students for participation in research studies. The credit system was fruitful regards raising participant numbers; however, it yielded a higher number of (psychology) participants than the other methods. Although participation of psychology students in research provides them with valuable experience of research methodology, their familiarisation with Cyberball meant that the trainee had to also consider alternative methods of recruitment. To facilitate recruitment of non-psychology students an application for an amendment to permit financial compensation (£8 per participant) was made to the research ethics committee and duly approved (Appendix M). This resulted in 30% of the sample involving non-psychology students. It was felt that this would lead to the sample being less biased, and therefore increase the generalisability of the results.

Metacognitive beliefs induction and manipulation check

Given the absence of audio recordings for the manipulation of positive and negative beliefs about paranoia in research settings, a novel paradigm was developed for use in the current study. Two electronic audio recordings (positive and negative) of Dr Judith Johnson (Lecturer/ Clinical Psychologist) interviewing Dr Rory Byrne (postdoctoral researcher in psychosis) were completed. The scripts for the recordings were developed by the first author in consultation with Professor Paul French (Associate director for Early Intervention Services) and the research team. The content was based loosely on relevant literature: 'Think you're crazy? Think again: A resource book for cognitive therapy for psychosis' (Morrison, Renton, French, & Bentall, 2014) and 'Overcoming paranoid and suspicious thoughts: a self-help guide using cognitive-behavioural therapy' (Freeman & Garety, 2012). The audio-recordings were developed to capture relevant themes from the Beliefs About Paranoia Scale – short form (BAPS; Gumley, Gillan, Morrison & Schwannauer, 2011; Morrison et al., 2005). Specifically the positive beliefs recording was based on the following survival items (6 items): 'It is important to be paranoid', 'If I were not paranoid others would take advantage of me', 'It is safer to be paranoid', 'My paranoia keeps me on my toes', 'Being paranoid keeps me sharp' and 'My paranoia protects me.' The negative beliefs recording was based on the negative beliefs about paranoia items (6 items): 'My paranoia gets out of control', 'I get upset when I feel paranoid', 'My paranoia prevents me from doing things I enjoy', 'My paranoid thoughts worry me', 'My paranoia gets exaggerated', 'My paranoia distresses me.'

The effectiveness of the recordings to manipulate positive and negative beliefs about paranoia was assessed using the BAPS. Participants completed the 6-item version at baseline and at time 3. Following the podcast (time 2), participants completed a state version ('How strongly do the following thoughts apply to you *at the moment?'*) of the highest loading (Gumley et al., 2011) positive beliefs items ('It is important to be paranoid' and 'It is safer to be paranoid') and negative beliefs items ('My paranoia distresses me' and 'My paranoia thoughts worry me'). Results showed that the positive recording was effective in manipulating positive beliefs about paranoia. Specifically, participants reported a significant increase in positive beliefs from time 1 to time 2 as well as from time 1 to time 3 following exposure to the positive recording. The group exposed to the negative recording, on the other hand, reported an increase in paranoia negative beliefs at time 2, which was not significant.

Furthermore, this was followed by a significant decrease between time 1 and time 3 as well as from time 2 to time 3. Therefore, the manipulation of metacognitive beliefs was only partially successful. As discussed in paper 2, the sample characteristics (i.e. predominantly psychology students) may have been largely responsible for this outcome. Moreover, during the process of debriefing, a large number of participants reported that they were surprised regarding the information provided during the negative recording given their understanding of paranoia as a 'normal' and sometimes 'helpful' experience. On reflection, collecting and synthesising qualitative feedback as part of this research would have aided the interpretation of findings.

Cyberball

Paranoia induction paradigms can be used to identify the causal processes involved in paranoid thinking; the factors of interest are manipulated and the effects on paranoid thinking examined. The choice of a paranoia induction paradigm for the present study was informed through the exploration of reviews that had synthesised and systematically reviewed studies using paradigms to manipulate paranoia thinking in clinical and non-clinical samples (Freeman, 2008; Owens, 2013). Freeman's (2008) narrative synthesis of the Virtual Reality (VR) literature describes VR as a useful and promising paradigm in eliciting paranoid thinking and in furthering our understanding of the mechanisms involved in paranoia. Although this has been demonstrated in a large (n = 200) and comprehensive analogue study (Freeman, 2008) the cost of VR equipment rendered this paradigm inaccessible. Owens' (2013) review of studies that had used paranoia paradigms (n = 27) to increase state paranoia identified five types of paradigms: stress vulnerability; manipulation of attentional focus; virtual games, virtual reality and 'other paradigms' (for example, manipulation of personal evaluations and motivational goal). Out of these, only studies investigating the use of virtual games (n = 5) to manipulate paranoia thinking were considered for the current study. Computerised paradigms have a number of strengths: they emphasise the importance of interpersonal context in inducing paranoid thinking and do not rely on interpersonal interactions; thus allowing for a stringent control of the experimental context (Owens, 2013). In addition, they are accessible and inexpensive. Studies that have investigated the impact of social stress on paranoia thinking through computerised games have used the Cyberball paradigm (Kesting, Bredenpohl, Klenke, Westermann, & Lincoln, 2013; Westermann et al., 2012; Williams, Cheung

& Choi, 2000), and the virtual version of the Prisoner's Dilemma Game (PDG; Ellette et al., 2013). Kesting et al. (2013) used Cyberball and a criticism feedback paradigm combined, and found a direct effect of social stress on state paranoia. Moreover, Westermann et al. (2012) has shown that Cyberball alone is effective in increasing paranoia thinking in analogue samples. Therefore, the criticism task was dropped for the present study, as Cyberball alone was deemed appropriate. It might also have been possible that activation of multiple negative states could have had implications when attempting to draw inferences about the hypothesised impact of metacognitive beliefs on paranoia, therefore, Cyberball alone was perhaps necessary for a tightly controlled experiment.

Discussion of results

During the early stages of the study the trainee became aware that psychology students, which made up the majority of the sample, were familiar with Cyberball. As already discussed in paper 2 this was managed by asking psychology students to immerse themselves in the study as best they could, and via extending recruitment methods to include non-psychology students; given that the results for the positive group were significant it is possible that this explanation might have sufficed. Moreover, during debriefing a number of non-psychology students reported that they did not believe they were playing with real opponents (Cyberball players are led to believe that they are playing against other people). Ellett and colleagues (2012) found that participants reported an increase in paranoid thinking only when they believed they were playing the PDG against another person, and not when playing against a computer. It might have been possible that the increase in paranoia frequency observed in the positive group was a direct response to the positive recording; information about the survival and usefulness of paranoia may have increased attentional deployment towards paranoid thoughts. Alternatively, the positive audio recording may have had a normalizing effect thus enabling participants to be more open about their experiences of paranoia at time 3.

Clinical implications and directions for future research

The finding that positive beliefs about paranoia are directly involved in the development of paranoia extends results from the cross-sectional literature and has important clinical implications. Recent clinical work in psychosis (Hutton, Morrison,

Wardle, & Wells, 2013) revealed that a short course of MCT was associated with a clinically significant reduction in delusion severity. More specifically, this case series study found that the individuals (n = 2) who achieved symptom improvement also achieved a drop in positive metacognitions (MCQ). The findings from our empirical study are encouraging; future, more targeted, pilot work in clinical paranoia using MCT techniques to challenge positive beliefs about paranoia (using the BAPS) could be helpful as it would add to the evidence regarding causality, as well as test whether MCT is a viable therapeutic approach in clinical paranoia. Depending on findings the effectiveness of MCT could be evaluated further in studies using mobile applications.

Recent work (Varese & Bentall, 2011) has suggested that the role of metacognitive beliefs may be more important in understanding the distress associated with hallucinatory experiences rather than hallucination occurrence per se. This reflects findings that many people in the community have unusual experiences and are not distressed by them (VanOs, Hanssen, Bijl, Ravelli, 2000; Johns et al., 2004; Pechey & Halligan, 2011). Therefore, the investigation of the role of metacognitive beliefs in paranoia-related distress is an important area that warrants further investigation. However, due to the difficulties encountered in increasing negative beliefs about paranoia perhaps future studies could explore the causal relationship between negative beliefs about paranoia and distress by designing and using paradigms that are aimed to reduce negative beliefs about paranoia. Then it could be observed whether distress decreases in tandem with negative beliefs.

Finally, additional avenues could involve conducting longitudinal research in people experiencing sub-clinical paranoia or paranoia within a first episode psychosis, assessing and measuring levels of metacognitive (positive and negative) beliefs about paranoia, and their prospective influence on the course of symptom development and distress.

Personal reflections

Before clinical training, I worked as a cognitive-behavioural therapist (CBT) within primary care adult mental health delivering 1:1 CBT for individuals with moderate to severe anxiety and/or depression. Prior to that, I worked as a clinical studies officer (CSO) in psychosis research, assisting large-scale trials with recruitment and baseline and follow-up assessments. My clinical and research interests encouraged me to apply

for clinical training, as I considered it a perfect way to combine my clinical interests with my passion for working with young people with distressing unusual experiences. During my first placement within an Early Intervention Service (EIS), I honed my skills in CBT by working with people who hear voices, and I was supported to work with a young person experiencing paranoia using a Meta-Cognitive approach (MCT). During this work, I became aware of the fact that, although MCT for psychosis is delivered in the National Health Service (either in a purist or more integrative manner), the model proposed by Morrison and the metacognitive model of paranoia (Morrison et al., 2005; Morrison et al., 2011) in particular, required further exploration. Therefore, I decided to embark on this research project with the aim to contribute towards furthering our understanding and management of paranoia within metacognitive theory.

During the remainder of my clinical (and psychotherapy) training, I have continued to work with individuals experiencing a wide range of difficulties (often resulting from traumatic experiences), and for whom sometimes, existing conceptualisations (such as CBT and/or MCT) felt restrictive or did not seem to fit their experiences or personal narrative. These observations encouraged me to think about paranoia more dynamically; as the result of intrapsychic, interrelational and social interactions rather than the product of maladaptive thinking (or thinking about thinking) alone. This introduced an interesting dynamic between the topic of my research project and myself that was not resolved until later in the process of clinical training.

Bowlby's attachment theory (1969; 1980), as well as Bentall et al.'s (2001) defense hypothesis, and the social account of paranoia (Cromby & Harper, 2009) offer useful frameworks for understanding paranoia and have been particularly influential in my thinking. Attachment provides a useful framework for understanding paranoia (Berry, Barrowclough & Warden, 2008) and studies have provided support for the association between anxious and avoidant attachment, and paranoid thinking in both clinical (Dozier, 1990; Dozier, Stevenson & Velligan, 1991; Mickelson, Kessler & Shaver, 1997; Wickam, Sitko & Bentall, 2015) and analogue samples (Berry, Wearden, Barrowclough & Liversidge, 2006; MacBeth, Schwannauer & Gumley, 2008; Pickering, Simpson & Bentall, 2008). Bentall and colleagues conceptualise persecutory delusions as an attributional defence that serves to protect individuals against low self-esteem (Bentall, Kinderman & Kaney, 1994). Here,

persecutory ideation is seen as a motivational belief that serves to maintain some intra-psychic function for the individual (Bentall et al., 2001). The problem with making external attributions, however, is that it leads to the activation of schemata that represent threats from others. Bentall et al.'s (2001) theory is interesting in its complexity; however, evidence in support of the relationship between self-esteem and paranoid ideation is mixed largely due to difficulties in accurately measuring implicit self-esteem. Cromby & Harper (2009) emphasise the predominance of social, relational, and material factors and their role both in the occurrence and perpetuation of paranoia. The impact of social deprivation on paranoia is documented (Wickam et al., 2014), however, although Cromby & Harper's (2009) theory provides a useful challenge to existing understandings of paranoia, it remains largely untested.

CBT (as well as family therapy) is the first line treatment for psychosis (NICE, 2014). We should perhaps hold in mind, however, that the amenability of cognitive theories to measurement and testing might have facilitated their prominence. Indeed, recent evidence suggests that CBT may be as equally effective for psychosis as other psychological treatments (Jones et al., 2014). Moreover, a recent study revealed the importance of the therapeutic relationship as having a causal role on outcome of psychotherapy on early psychosis (Goldsmith et al., 2015) opening up space for relational approaches in psychosis such as Cognitive-Analytic Therapy (CAT; Taylor et al., 2014). Evidence shows that childhood adversity is associated with paranoia in adulthood (Bentall, Wickam, Shevlin & Varese, 2012) and that this relationship is influenced by insecure attachment (Sitko et al., 2014). Therefore, helping an individual using CAT to understand their experience of paranoia (an interpersonal process) from an interpersonal perspective (for example, by looking at its interpersonal origin), while attending carefully to the therapeutic relationship (use of rupture-repair sequences to help the person feel safe and secure and enable a more secure attachment style) sound promising. Moreover, CAT can also be helpful given the impact of social inequality on paranoia (Wickam, Taylor, Shevlin & Bentall, 2014) as it can situate the individual within a social context. Drawing upon community psychology perspectives and psychopolitical theories may facilitate community work where the impact of social adversity can undermine individual psychotherapy work (Smail, 2005). Although these are exciting avenues, the use of CAT in psychosis is yet to be evidenced.

Given the complexity of this clinical phenomenon and the observation (for example, during the CBT for psychosis debate; http://www.kcl.ac.uk/ioppn/news/events/2014/April/Maudsley-Debate--CBT-for-Psychosis.aspx) that arguments such as the 'one size fits all' can shut down helpful dialogue and contribute to the paucity of potentially fruitful research endeavours, I have come to realise that there can be no 'single factor' that could adequately explain the development and perpetuation of paranoia, the distress associated with it or any of the other dimensions involved (for example, what causes the degree of belief conviction, resistant to change). It is possible that different factors are involved in different dimensions. Paranoia researchers should therefore continue to propose well-articulated theories and to test their hypothesised causal relationships openly and critically, while holding in mind that we are all operating under limited knowledge and that the individuals we work with are bigger than our paradigms.

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Appendices

Appendix A: EPHPP quality assessment ratings

	EPHPP Quality Assessment							
Paper	Selection bias	Study design	Confounders	Blinding	Data	Withdrawals	Overall quality rating	Adapted quality rating
Morrison 2003	2	3	2	2	1	2	2- Moderate	1- Strong
Fraser 2006	2	3	3	2	1	2	3- Weak	3- Moderate
Valiente 2012	2	3	3	2	1	2	3- Weak	2- Moderate
Morrison 2011	2	3	2	2	1	2	3- Weak	2- Moderate
Larøi 2015	3	3	3	2	1	2	3- Weak	3- Weak
García-Montes 2005	3	3	2	2	1	2	3- Weak	2- Moderate
Varese 2011	3	3	1	2	1	2	3- Weak	3- Moderate
Morrison 2005	3	3	3	2	1	2	3- Weak	2- Weak
Campbell 2007	3	3	2	2	1	2	2- Weak	1- Moderate
Gumley 2011	3	3	1	2	1	2	3- Weak	2- Moderate

Appendix B: Study advert

[redacted]

Version 4: 14/11/14

Research Participation

Want to find out more about how a virtual game can affect the experience of suspiciousness, paranoia and associated mood states? Want to help with clinically relevant research?

Want to learn more about a career in clinical psychology, or have a chance to win a voucher or receive a reimbursement for participation?

We are interested in the way people think about suspiciousness and paranoia and the impact of distraction on suspiciousness, paranoia and mood. Participants will 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 as well as enter into a raffle with the chance of winning one of two high street gift vouchers, as a token of appreciation. Alternatively, participants can elect to receive a reimbursement for participation.

Who can take part?

- Students at the University of Manchester
- Aged 18 years or older
- English speaking
- Normal or corrected vision and hearing
- No current or past involvement with secondary care psychiatric services

What will it involve for me?

You will be asked to see a researcher on campus for approximately 45 minutes. The session will involve completing some questionnaires, listening to a podcast, playing a virtual game on the computer and doing a Quiz. It is possible that the podcast or games can be minimally distressing, however, we hope that our findings can in future be applied to help people who experience suspiciousness or paranoia. You may complete these tasks alongside other students, but your answers will remain confidential.

Further Information

If you would like to take part or have any questions about the study, please get in touch: **Maria Kaltsi. Email:** maria.kaltsi@postgrad.manchester.ac.uk

Suspiciousness and paranoia Maria.kaltsi@postgrad.manchester.ac.uk

Appendix C: Participant information sheet

[redacted]

Version 4: 14/11/2014

School of Psychological Sciences
2nd Floor Zochonis Building
The University of Manchester
Brunswick Street
Manchester M13 9PL

Participant Information Sheet

Study Title: Exploring the relationship between suspicious thoughts, emotions and task performance.

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. Talk to others about the study if you wish. Thank you for reading this.

What is the study about?
This study looks at the relationship between suspicious thoughts, emotions and task performance. We are using various tasks such as a virtual game and a memory test. We hope that our findings can in future be applied to help people who experience negative emotions and paranoia.

Why have I been asked to take part?
We are inviting you to take part because you are a student or a member of staff at the University of Manchester and are 18 years old or over. People involved will also have normal or corrected vision and hearing, no current or previous involvement with secondary care psychiatric services and speak English. We are hoping for 110 participants to take part in this study.

Who can participate?
Due to the nature of this study we are asking everyone some questions in order to determine whether there is any reason they shouldn't participate. If you respond 'yes' to any of the following questions you will not be able to participate in the present study:

1. Have you ever been hospitalised for assessment and/or treatment of schizophrenia, bipolar disorder, a psychosis-related problem (e.g. depression with psychosis, etc.)?
2. Have you ever been given a diagnosis for any of the above?
3. Have you ever been advised to take medication for hearing voices, paranoia or unusual thoughts?

What will participation involve?
If you choose to take part, a researcher will arrange to meet with you at a room at the University of Manchester. The study will take no longer than 60 minutes and will involve completing some questionnaires, listening to a

podcast, playing a virtual game on a computer and taking part in a memory test. Some of the questions ask if you experience suspicious or paranoid thoughts but you will not be asked to provide details of these. You may complete these tasks alongside other students, but your answers will remain confidential.

Do I have to take part?
No. 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 saying you agree to take part. 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.

Are there any risks involved in taking part?
There is the possibility that you may find some of the questions in this study uncomfortable or upsetting. If this is the case, you are free to leave any of these questions unanswered and you are welcome to end your participation any time. The study will also involve listening to a podcast containing information on suspiciousness and paranoia, playing a virtual game on the computer and doing a Quiz. It is possible that the podcast or games can be minimally distressing, however If any aspect of the research is upsetting, we will signpost you to sources of support, including the University Student Services, NHS 111 Emergency Care number, or the Samaritans (Tel: 08457 90 90 90). Moreover, we can support you to access your GP but we will only do this with your consent.

What are the likely benefits of this study?
Some people enjoy completing the tasks involved in research and the opportunity to talk to someone about their experiences. The project will help us to understand more about the impact of competing tasks on the experience of suspiciousness and paranoia and explore people's emotional reactions to both. We hope that this study will inform our ways of supporting people who are distressed by feeling suspicious or paranoid.

Reimbursement for my time
Participants will 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 and enter into a raffle with the chance of winning one of two £50 high street gift vouchers, as a token of appreciation. Alternatively participants can elect to receive £8 for their efforts.

[redacted]

What if I have questions or want to complain about this study?
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 2758093 or by email to research-governance@manchester.ac.uk.

In the unlikely 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.

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?
A trainee clinical psychologist will be analysing the data collected in this project as part of their thesis, supervised by Professor Anthony Morrison and Dr Sandra Bucci. The findings will be presented to a range of mental health professionals and academics. Hopefully, the research will also be published in a scientific journal. If requested, the researchers can send you a copy of the final published article.

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:

Maria Kaltsi
(Trainee Clinical Psychologist)

Version 4: 14/11/2014

Email: maria.kaltsi@postgrad.manchester.ac.uk

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Appendix D: Audio recording scripts

Script 1: Positive Beliefs about Paranoia

Introductions:

JUDE
Hello, my name is Dr Helen Lester and I am a Lecturer at the University of Leeds and honorary Lecturer at the Univeristy of Manchester. Today, I will be discussing the subject of paranoia with Dr Rory Byrne. Dr Byrne has extensive research in the area of psychosis and works as a postgraduate researcher in the Psychosis Research Unit. He is involved primarily in user-led research into early detection and intervention for psychosis, and the prevention or treatment of psychosis using psychological therapies. The reason why I felt that it would be helpful to have this discussion today is because research findings in the area of paranoia are increasingly pointing towards the direction that paranoia is a normal… and in a lot of cases an important process. I feel that, as The University of Manchester is an organization with an extensive research portfolio in the area of psychosis and paranoia, we have a duty of care to keep the public informed of recent important developments. Dr Byrne, thank you for coming here today.

RORY
Thank you for inviting me. As you already said, informing the public correctly on important health matters is our responsibility. I am glad to be here today to discuss the important topic of paranoia. It is vital that the public is well informed about the most up to date research on paranoia.

JUDE
OK, so at this point it may be helpful if you could tell us what you mean when you say paranoia. What actually is paranoia?

RORY
Paranoia goes by a variety of names such as paranoid feelings, suspicious thoughts…. The term 'paranoia' has negative connotations for many people so we tend to use the term suspicious or paranoid thoughts…
Paranoia is typically characterized by the fear that something bad is happening or about to happen… and that what is happening or about to is caused by others. For example, a person might fear that someone is trying to cause them physical or emotional harm by spreading rumors about them.

JUDE
Could you please expand a bit more on this?

RORY
People from a different country, people who do not share our religious or political beliefs or our sexual orientation, even people with an unusual haircut or style of dress – all are frequently the objects of our distrust. On a more mundane level, who hasn't worried about walking along a deserted street late at night? Who hasn't fretted, approaching home after a time away, that the house may have been burgled in their absence? Who hasn't found themselves suspecting, perhaps only for a moment, that a friend, colleague or family member hasn't their best interests at heart? These anxieties

may take many different forms and may vary hugely in degree, but what unites them is the suspicion that other people intend to do us harm.

JUDE

It sounds like paranoia is a common experience…

RORY

Yes, there is no doubt that paranoia is extremely common among people of all ages, from adolescence to old age. In fact, paranoia may be almost as common as depression or anxiety, with one third of the UK population regularly experiencing suspicious thoughts. Most of those people aren't very troubled by their suspicious thoughts, and only 3-5% will have quite severe paranoia and will need specialist treatment.

So clinical cases aside, we can observe paranoia in every-day people in their everyday lives. These statistics may seem surprising. I know I've sometimes felt that way, you may be thinking, but I had no idea that so many other people have had the same feelings. One explanation for this surprise may be that most people find it very difficult to talk about these sorts of worries with those closest to them. No one, after all, wants to be seen as anxious or fearful. I guess… even if we do summon the courage to voice our fears, we often dismiss them in the same breath: ' I'm probably just being paranoid, but…' (long pause). When are we more likely to experience paranoia?

JUDE

Why do paranoid or suspicious thoughts occur?

RORY

Daniel Freeman and colleagues at the University of Oxford have identified two many types of trigger for suspicious thoughts: The situations, events and experiences we encounter in the world and the way we feel inside. Suspicious thoughts don't just occur out of the blue…

Suspicious thoughts often arise when we are in social situations, when we feel exposed, when we think we might be blamed or accused or when we are alone. Moreover, some people's fears are triggered by just one specific experience while for other people… their fears may be provoked by a range of situations.

JUDE

Could you please elaborate…?

RORY

OK let's consider the example of social situations. For many people social situations can be stressful events. We may feel a pressure to fit in with the other people there… It can seem as though we are forced to perform. We have to try to be entertaining, amusing, articulate, even just plain polite… In situations that provoke these kinds of anxieties it's not surprising that people may interpret what's going on around them negatively. If we spot people looking at us while talking to someone else we wonder whether they're talking about us… So examples of suspicious thoughts would include walking down the street and seeing a group of people standing around talking. If they start laughing as we walk past, we may sometimes worry that they are laughing at us… Or… Being at a party and having the thought that some people are saying negative things about us behind our back…

To a greater or lesser extent, we all experience paranoid feelings on occasion, for the simple reason that paranoid fears and suspicions often serve some highly useful functions.

JUDE
So paranoia can have a useful function…

RORY
Exactly. As I have already mentioned… paranoid, suspicious thoughts can be caused by a combination of stress and major life events as well as negative feelings such as anxiety and depression.
Typically, paranoia starts when something stressful or unexpected happens—exam stress, changes in our sleep pattern, the spread of rumors... Such events create uncertainty. Most of us tend to deal with the unknown by trying to give the events meaning. This type of mental processing sets in motion a common psychological reaction known as "hypervigilance." Suddenly, to make sense of things, we start paying close attention to everything going on around us. Maybe our friend didn't echo our remarks at the last outing, or maybe we were left off a gathering. So, in this context paranoia or suspiciousness can be seen as important as it can help us find answers and therefore bring a close to our search for meaning or our worry.

JUDE
Does paranoia have any other useful functions…?
RORY
Hmm… how about when being suspicious can help us take the right precautions when it comes to meeting people with malicious intent. In those cases paranoia can ensure our survival. I guess we are all familiar with the example of walking back home at night and constantly checking behind our back… In this instance we are right to be suspicious of others. The world is, after all, sometimes a dangerous and hostile place.
Moreover, Richard Bentall and colleagues at the University of Liverpool have found that in people with traumatic early experiences paranoia can protect them from negative feelings. When the paranoia is activated the individual's self-esteem improves therefore in this case, suspiciousness or paranoia serves a protective function.

JUDE
OK thank you for this. Individuals who will be accessing this podcast will either be students or staff at the University so I am wondering what you would suggest to someone who identified with the experiences you have described. What do they need to do?

RORY
First of all I would suggest that they bring some of the information that we are discussing in mind. The fact the paranoia is common and in many occasions helpful and protective. If however, they do worry about their experiences I would advice them to contact their GP or book an appointment at the Student Counseling Service – we have provided extensive training there so everyone is well on board with the current evidence on paranoia and will be able to re-assure them.

JUDE
Great. This is very helpful. I know you are busy Dr Byrne so thank you for your time and for sharing with us your important findings.

RORY
My pleasure. Hopefully, I have been able to convey the message that paranoia should not worry people as much as it has done in the past.

Script 2: Negative Beliefs about Paranoia

Introductions:

JUDE
Hello, my name is Dr Helen Lester and I am a Lecturer at the University of Leeds and honorary Lecturer at the Univeristy of Manchester. Today, I will be discussing the subject of paranoia with Dr Rory Byrne. Dr Byrne has extensive research in the area of psychosis and works as a postgraduate researcher in the Psychosis Research Unit. He is involved primarily in user-led research into early detection and intervention for psychosis, and the prevention or treatment of psychosis using psychological therapies. The reason why I felt that it would be helpful to have this discussion today is because research findings in the area of paranoia are increasingly pointing towards the direction that paranoia is not as safe as people once thought. In fact, it is quite the opposite! And I feel that, as The University of Manchester is an organization with an extensive research portfolio in the area of paranoia, we have a duty of care to keep the public informed of recent important developments. Dr Byrne, thank you for coming here today.

RORY
Thank you for inviting me. As you already said, informing the public correctly on important health matters is our responsibility. I am glad to be here today to discuss the important topic of paranoia. It is vital that the public hear the most up to date research on paranoia. By increasing awareness about the latest developments in paranoia we might be able to prevent serious mental health problems.

JUDE:
Please do tell us a little bit more about this.

RORY
Well… studies have shown that the longer we leave paranoid symptoms untreated or ignored… the worse the outcome… and the chance of a full recovery also tends to decrease. Untreated paranoid symptoms can lead to people staying in hospital for longer periods and having to take more powerful medications and for longer. In addition, paranoia tends to have a huge impact on peoples' lives – people with this problem are more likely to experience a breakdown in their relationships, lose their employment, have serious difficulties completing their studies and so forth.

JUDE
OK, so ignoring paranoia can have a huge impact on peoples' lives. At this point it would be helpful if you could tell us what you mean when you say paranoia. What actually is paranoia?

RORY
Paranoia is typically characterized by the fear that something bad is happening or about to happen… and that 'the bad' that is about to happen is caused by others. For example, a person might fear that someone is trying to cause them physical or emotional harm by spreading rumours about them. Some people even fear that others want to kill them. People with paranoia can also feel their physical safety may be threatened by one or more people.

JUDE
Can paranoia be experienced in a mild as well as in a more severe form?

RORY
Absolutely. In its more severe form individuals tend to be convinced about the reality of their thoughts. They are convinced for example, that others are trying to cause them harm. People at the severe end will often receive a diagnosis of schizophrenia. However, paranoia can also be a feature of another very serious condition called paranoid personality disorder. In any case, people at the severe end of Paranoia tend to be extremely frightened, even frightened for their life, and very distressed by the presence of their experiencers.

JUDE
OK thank you for this. Individuals who will be accessing this podcast will either be students or staff at the University so it could also be helpful to talk about paranoia in its milder form. What does paranoia look like in the beginning… before it becomes uncontrollable and distressing, and even life threatening?

RORY
Describing paranoia in its milder form so people know exactly what they need to look out for is certainly one of the recommendations we have made based on our recent research findings on paranoia. People with milder forms of paranoia, like the people who might be listening to this podcast, tend to have similar thoughts to people in the severe end but the difference is that people with mild beliefs tend to doubt the reality of their experiences… they are better at questioning their thoughts. For example, someone might think that people are spreading rumors about me, or people are trying to cause me psychological harm in some way, but they will be able to challenge the reality of their thoughts/beliefs. So although these thoughts may initially be upsetting this tends to reduce when the person has questioned these thoughts. People in this category may also have a felt sense… not feeling quite right experience… that something bad is about to happen or happening… but they may not be able to articulate exactly what they feel.

JUDE
OK. So if someone can identify with the experiences you have described, what do they need to do?

RORY
This is the important part I think. Up until recently, we regarded these experiences as normal… harmless. However, our research here at Manchester suggests that these experiences are not as harmless as we first thought. Certain stressors such as exam stress can tip someone's experiences from mild to severe quite quickly… so catching these thoughts early is a very good first step. Studies by Alison Young, Clinical Professor of Psychiatry at the University of Manchester and the Psychosis Research Unit at Greater Manchester West NHS Foundation trust and colleagues suggest that at least 50% of people who experience suspicious thoughts or unusual experiences will go on to develop first episode psychosis within one year. The second step would be to speak to a professional as soon as they notice themselves having such thoughts or experiences. We could recommend that people contact their GP immediately or book an appointment at the Student Counseling Service – we have provided extensive training there so everyone is well on board with the current evidence on paranoia.

JUDE
Great. This is very helpful. I know you are busy Dr Byrne so thank you for your time and for sharing with us your important findings.

RORY
My pleasure. Hopefully, I have been able to convey the message that paranoia should be not taken lightly and that if untreated can quickly lead to serious conditions such as long-term MH problems, hospitalisation and so forth. So please do take action before it's too late.

The End

Appendix E: Consent form

[redacted]

Version 2; 25/07/2014

CONSENT FORM

Client Identification Number for this study: …….

Title of Project: The role of competing tasks on paranoia, suspiciousness and associated mood states

Name of Researcher:

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet 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 consent to my GP being contacted in the event that I experience very high levels of distress and need support of this nature and that the researchers will inform my GP of the study I have taken part in. ☐

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. . ☐

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 F: Study measures

Measures

Manipulation check: In order to assess the effectiveness of the manipulation, a state version of the highest loading positive and highest loading negative beliefs of the Beliefs about Paranoia Scale (BAPS- Gumley, Gillan, Morrison & Schwannauer, 2010) will be re-administered. The state-adapted instruction will be 'How strongly do the following thoughts apply to you *at the moment?* In their original paper Gumley et al. (2010), identified the highest loading positive and negative items as follows:
Positive items: 'It is important to be paranoid' and 'It is safer to be paranoid'
Negative items: 'My paranoia distresses me', and 'My paranoia thoughts worry me'
A successful manipulation is defined as where post-test scores are greater than baseline scores on these items.

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 <u>in the moment</u> 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.																
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.																

Paranoid Thought Scales
Please read each of the statements carefully.
They refer to thoughts and feelings you may have had about others over the last month.
Think about the last month and indicate the extent of these feelings from 1 (Not at all) to 5 (Totally). Please complete both Part A and Part B.
(N.B. Please do not rate items according to any experiences you may have had under the influence of drugs).

Part B.	Not at all		Somewhat		Totally
1. Certain individuals have had it in for me	1	2	3	4	5
2. I have definitely been persecuted	1	2	3	4	5
3. People have intended me harm	1	2	3	4	5
4. People wanted me to feel threatened, so they stared at me	1	2	3	4	5
5. I was sure certain people did things in order to annoy me	1	2	3	4	5
6. I was convinced there was a conspiracy against me	1	2	3	4	5
7. I was sure someone wanted to hurt me	1	2	3	4	5
8. I was distressed by people wanting to harm me in some way	1	2	3	4	5

9. I was preoccupied with thoughts of people trying to upset me deliberately	1	2	3	4	5
10. I couldn't stop thinking about people wanting to confuse me	1	2	3	4	5
11. I was distressed by being persecuted	1	2	3	4	5
12. I was annoyed because others wanted to deliberately upset me	1	2	3	4	5
13. The thought that people were persecuting me played on my mind	1	2	3	4	5
14. It was difficult to stop thinking about people wanting to make me feel bad	1	2	3	4	5
15. People have been hostile towards me on purpose	1	2	3	4	5
16. I was angry that someone wanted to hurt me	1	2	3	4	5

Beliefs about Paranoia Scale

The experience of feeling paranoid is a common one. It is particularly common when under stress. Listed below are a number of attitudes and thoughts that people have expressed about paranoia. There are no right or wrong answers. Please give a response about how you generally feel.

Please read each statement and then **circle the number that corresponds to how much you believe this.** Please give a response to all the statements.

I believe that…….	**Not at all**	**Somewhat**	**Moderately so**	**Very much so**
1. My paranoia gets out of control	1	2	3	4
2. I get upset when I feel paranoid	1	2	3	4
3. It is important to be paranoid	1	2	3	4
4. If I were not paranoid others would take advantage of me	1	2	3	4
5. It is safer to be paranoid	1	2	3	4
6. Everybody feels paranoid at some time or other	1	2	3	4
7. My paranoia prevents me from doing things I enjoy	1	2	3	4
8. Most people get paranoid sometimes	1	2	3	4
9. My paranoid thoughts worry me	1	2	3	4
10. Paranoia is normal	1	2	3	4

11. My paranoia keeps me on my toes	1	2	3	4
12.Being paranoid keeps me sharp	1	2	3	4
13. Everybody is paranoid on some level	1	2	3	4
14.My paranoia gets exaggerated	1	2	3	4
15. My paranoia protects me	1	2	3	4
16.Paranoia is something everybody has to some extent	1	2	3	4
17. Being paranoid is just human nature	1	2	3	4
18. My paranoia distresses me	1	2	3	4

Meta-Cognitions Questionnaire (Revised)

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.

		Do not agree	Agree slightly	Agree moderately	Agree very much
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 think a lot about my thoughts	1	2	3	4
4.	I could make myself sick with worrying	1	2	3	4
5.	I am aware of the way my mind works when I am thinking through a problem	1	2	3	4
6.	If I did not control a worrying thought, and then it happened, it would be my fault	1	2	3	4
7.	I need to worry in order to remain organised	1	2	3	4
8.	I have little confidence in my memory for words and names	1	2	3	4

9.	My worrying thoughts persist, no matter how I try to stop them	1	2	3	4
10	Worrying helps me to get things sorted out in my mind	1	2	3	4
11.	I cannot ignore my worrying thoughts	1	2	3	4
12.	I monitor my thoughts	1	2	3	4
13.	I should be in control of my thoughts all of the time	1	2	3	4
14.	My memory can mislead me at times	1	2	3	4
15.	My worrying could make me go mad	1	2	3	4
16.	I am constantly aware of my thinking	1	2	3	4
17.	I have a poor memory	1	2	3	4
18.	I pay close attention to the way my mind works	1	2	3	4
19.	Worrying helps me cope	1	2	3	4
20.	Not being able to control my thoughts is a sign of weakness	1	2	3	4

21.	When I start worrying, I cannot stop	1	2	3	4
22.	I will be punished for not controlling certain thoughts	1	2	3	4
23.	Worrying help me to solve problems	1	2	3	4
24.	I have little confidence in my memory for places	1	2	3	4
25.	It is bad to think certain thoughts	1	2	3	4
26.	I do not trust my memory	1	2	3	4
27.	If I could not control my thoughts, I would not be able to function	1	2	3	4
28.	I need to worry, in order to work well	1	2	3	4
29.	I have little confidence in my memory for actions	1	2	3	4
30.	I constantly examine my thoughts	1	2	3	4

Depression Anxiety Stress Scales

Please read each statement and circle an appropriate number (see below) 0, 1, 2 or 3, which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

0 = Did not apply to me at all
1 = Applied to me in some degree, or some of the time
2 = Applied to me a considerable degree, or a good part of the time
3 = Applied to me very much, or most of the time

1. I was aware of dryness of my mouth	0	1	2	3
2. I couldn't seem to experience any positive feeling at all	0	1	2	3
3. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
4. I just couldn't seem to get going	0	1	2	3
5. I had a feeling of shakiness (e.g. legs going to give way)	0	1	2	3
6. I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
7. I felt that I had nothing to look forward to	0	1	2	3
8. I felt sad and depressed	0	1	2	3

9. I had a feeling of faintness	0	1	2	3
10. I felt that I had lost interest in just about everything	0	1	2	3
11. I felt I wasn't worth much as a person	0	1	2	3
12. I perspired noticeably (e.g. hands sweaty)	0	1	2	3
13. I felt scared without any good reason	0	1	2	3
14. I felt that life wasn't worthwhile	0	1	2	3
15. I had difficulty in swallowing	0	1	2	3
16. I couldn't seem to get any enjoyment out of things I did	0	1	2	3
17. I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3

0 = Did not apply to me at all
1 = Applied to me in some degree, or some of the time
2 = Applied to me a considerable degree, or a good part of the time
3 = Applied to me very much, or most of the time

18. I felt down-hearted and blue	0	1	2	3
19. I felt I was close to panic	0	1	2	3
20. I feared that I would be thrown by some trivial or un-familiar task	0	1	2	3
21. I was unable to become enthusiastic about anything	0	1	2	3
22. I felt I was pretty worthless	0	1	2	3
23. I felt terrified	0	1	2	3
24. I could see nothing in the future to be hopeful about	0	1	2	3
25. I felt that life was meaningless	0	1	2	3
26. I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
27. I experienced trembling (e.g. in the hands)	0	1	2	3
28. I found it difficult to work up the initiative to do things	0	1	2	3

Appendix G: Distress protocol

Division of Clinical Psychology,
2nd Floor Zochonis Building,
University of Manchester,
Brunswick Street,
Manchester
M13 9PL
Tel: 0161 3060400

Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population
Screening Interview & Distress Protocol
(V.1, 04/04/2014)

All screening will be conducted via email by Maria Kaltsi, Trainee Clinical Psychologist, and accredited, Cognitive-Behavioural Psychotherapist.

Participants with a history of severe mental health problems (e.g., schizophrenia, bipolar disorder, affective psychosis), current use of secondary services (e.g., CMHT, EIS), and on psychiatric medication will be excluded from the present study. Specifically, in order to screen for the above criteria participants will be asked the questions detailed below. Anyone who responds 'yes' will be deemed ineligible to participate in the study and will not be contacted further:

Dear x,

Thank you for your interest in the study. Due to the nature of this study we are asking everyone some questions in order to determine whether there is any reason they shouldn't participate. If you respond 'yes' to any of the following questions you will not be able to participate in the present study:

1. Have you ever been hospitalised for assessment and/or treatment of schizophrenia, bipolar disorder and/ or a psychosis related problem (e.g. depression with psychosis, etc.)?
2. Have you ever been given a diagnosis for any of the above?
3. Have you ever been advised to take medication for hearing voices, paranoia or unusual thoughts?

Thank you for your time and interest.

Yours Sincerely,

Distress Protocol

Student services will be informed prior to commencement of the study and the researcher will ensure that participants are registered with a GP and know their name and telephone number. All participants will be provided with pocket sized laminated cards with details of the local A&E department and the following help-line numbers:

- NHS Direct
- The Samaritans
- 'Mind' mental health charity
- 'RETHINK' mental health charity

If participants experience distress during testing they will be asked if they wish to take a break or end the session and their decision will be respected. The researcher will also check distress at the end of the experimental session. Participants who report distress will be encouraged to contact their GP and would be helped to do so if they wish, but the decision regarding whether or not they access help would remain theirs. A follow-up phone call will be made within 24 hours to all participants to check that they are not distressed. Following testing, all participants will be provided with normalising information about paranoia.

Appendix H: SPSS output (t-test on the change scores)

It doesn't matter which of these two methods you use, but the t-test enables you to very simply test the effec sampling distributions using the bootstrap. See bottom of this file.

PC_Frequency

Repeated Measures ANOVA

```
GLM Baseline_PC_Freq_Total Outcome_PC_Freq_Total BY MetaCog_Induction
  /WSFACTOR=Time 2 Polynomial
  /METHOD=SSTYPE(3)
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=Time
  /DESIGN=MetaCog_Induction.
```

General Linear Model

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	.174	1	.174	.015	.903
Time * MetaCog_Induction	Linear	144.989	1	144.989	12.401	.001
Error(Time)	Linear	1239.284	106	11.691		

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	156546.005	1	156546.005	1368.215	.000
MetaCog_Induction	84.005	1	84.005	.734	.393
Error	12128.120	106	114.416		

```
/CRITERIA=CI(.95).
```

T-Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Differ
Change_PC_Freq	Equal variances assumed	6.302	.014	3.522	106	.001	3.28621	
	Equal variances not assumed			3.617	101.176	.000	3.28621	

N.B. 3.522 squared = 12.404

Repeated Measures ANOVA

"

```
GLM Baseline_PC_Dis_Total Outcome_PC_Dis_Total BY MetaCog_Induction
  /WSFACTOR=Time 2 Polynomial
  /METHOD=SSTYPE(3)
  /CRITERIA=ALPHA(.05)
  /WSDESIGN=Time
  /DESIGN=MetaCog_Induction.
```

General Linear Model

Tests of Within-Subjects Contrasts

Measure: MEASURE_1

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Linear	.100	1	.100	.006	.936
Time * MetaCog_Induction	Linear	126.043	1	126.043	8.208	.005
Error(Time)	Linear	1597.032	104	15.356		

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	159822.372	1	159822.372	729.822	.000
MetaCog_Induction	566.428	1	566.428	2.587	.111
Error	22774.761	104	218.988		

t-test on change score

```
T-TEST GROUPS=MetaCog_Induction(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Change_PC_Dis
```

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. E Differe
Change_PC_Dis	Equal variances assumed	3.816	.053	2.865	104	.005	3.10422	
	Equal variances not assumed			2.938	103.996	.004	3.10422	

PC_Frequency

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Change_PC_Freq INPUT=MetaCog_Induction
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
```

Bootstrap

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

```
T-TEST GROUPS=MetaCog_Induction(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Change_PC_Freq
  /CRITERIA=CI(.95).
```

T-Test

Bootstrap for Independent Samples Test

			Bootstrap[a]				
						95% Confidence Interval	
		Mean Difference	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Change_PC_Freq	Equal variances assumed	3.28621	.02051	.92001	.002	1.49809	5.05905
	Equal variances not assumed	3.28621	.02051	.92001	.003	1.49809	5.05905

```
BOOTSTRAP
  /SAMPLING METHOD=SIMPLE
  /VARIABLES TARGET=Change_PC_Dis INPUT=MetaCog_Induction
  /CRITERIA CILEVEL=95 CITYPE=PERCENTILE  NSAMPLES=1000
  /MISSING USERMISSING=EXCLUDE.
```

Bootstrap

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	1000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

```
T-TEST GROUPS=MetaCog_Induction(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=Change_PC_Dis
  /CRITERIA=CI(.95).
```

T-Test

Bootstrap for Independent Samples Test

			Bootstrap[a]				
						95% Confidence Interval	
		Mean Difference	Bias	Std. Error	Sig. (2-tailed)	Lower	Upper
Change_PC_Dis	Equal variances assumed	3.10422	.05511	1.04559	.005	1.22363	5.34976
	Equal variances not assumed	3.10422	.05511	1.04559	.004	1.22363	5.34976

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Appendix I: Original research proposal

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	Maria Kaltsi
Title of Project	Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population
Supervisor(s) Academic	Professor Anthony Morrison and Dr Sandra Bucci
Clinical/Field	N/A

INTRODUCTION

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

Paranoid or persecutory delusions are one of the most frequent symptoms of psychosis (Freeman, Garety, Kuipers, Fowler & Bebbington, 2002), and tend to be distressing or disruptive for the individual experiencing them (Freeman, Freeman & Garety, 2006). Paranoia has been defined as a belief that 'harm is occurring, or is going to occur, and that the persecutor has the intention to cause harm' (Freeman & Garety, 2000). Several cognitive theories have accounted for the occurrence of paranoia. Bentall and colleagues conceptualise persecutory delusions as an attributional defence that serves to protect against low-self esteem in normal individuals (Bentall, Kinderman & Kaney, 1994). Their theory suggests that by making external attributions for negative events, rather than blaming the self, negative thoughts about the self are prevented from reaching awareness, and the individual's self-esteem is preserved. The problem with this mechanism however, is that it leads to the activation of schemata that represent threats from others. Evidence in support of the relationship between self-esteem and paranoid ideation is conflicting. For example, Chadwick & Lowe (1994) found that self-esteem does not lower when persecutory delusions improve, whilst Freeman et al. found low self-esteem to be common in people with persecutory delusions. Trower and Chadwick's (1995) theory of two types of paranoia ('poor me' and 'bad me') provides a framework for understanding the contradictory evidence on persecutory delusions. According to the authors people with 'poor me' paranoia tend to see themselves as victims and to blame others. People with 'bad me' paranoia on the other hand, tend to blame themselves and to view others as justifiably punishing them. Freeman et al.'s (2002) theory of persecutory delusions incorporates Bentall et al.'s concept of attributional bias but argue that persecutory delusions are a reflection of the individual's experience of anxiety and not a defence. Wells and Matthews' (1994) self-referent executive function (S-REF) model has also provided a useful framework for understanding vulnerability to paranoia. This model suggests that metacognitive beliefs about mental experiences are important in psychological dysfunction. It proposes that metacognitive beliefs drive self-focused attention and ruminative processes, worry and the interpretation of events, and predicts that positive beliefs about mental events will be associated with an increase in frequency, whereas negative beliefs about such experiences will be associated with distress and disability. In order to explore the role of metacognition in paranoia, Morrison et al. (2005; 2011) examined the above predictions both in a clinical and non-clinical population group, and found results consistent with the S-REF. Specifically, they found positive and negative beliefs about paranoia to be associated with the experience of paranoia, and negative beliefs about paranoia to be associated with distress associated with delusional ideation. These findings offer some tentative support for a metacognitive model of clinical paranoia. However, the nature of the design meant that the

authors could not make causal inferences. The present study will aim to address some of the methodological limitations reported by Morrison et al. (2011) by exploring the causal role of metacognitive beliefs on paranoia frequency and distress utilising an experimental design.

AIMS & HYPOTHESES

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

This study will use an experimental design to assess the impact of metacognitive beliefs about paranoia on paranoia frequency and distress associated with paranoia in a non-clinical population. Specifically, this study will be testing the following hypotheses:

1. Participants in the negative beliefs about paranoia group (NBPG) will score higher than participants in the positive beliefs about paranoia group (PBPG) on measures of distress associated with paranoid thinking.
2. Participants with positive beliefs about paranoia will score higher than participants with negative beliefs on paranoia frequency.

METHOD

EXPERIMENTAL DESIGN

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

The experiment will be conducted as a randomised group comparison. Independent variable: Group (two levels: positive beliefs/negative beliefs). Dependent variables: Frequency of paranoia; paranoia associated distress.
At baseline, participants will be assessed with regard to their metacognitive beliefs, trait and state paranoid ideation, paranoia associated distress and other relevant variables such as anxiety and deservedness of paranoia. Participants will then be randomised to the PBPG or NBPG using sealedenvelope.com. Following the manipulation the highest loading items on positive/survival beliefs and negative beliefs from the BAPS (state version) will be re-administered and will serve as a manipulation check questionnaire. The state-adapted instruction will be 'How strongly do the following thoughts apply to you *at the moment?* All participants will then enter the paranoia induction stage. Finally, participants will be reassessed with regard to metacognitions, state paranoia and distress.

PARTICIPANTS

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

All participants will be recruited at the University of Manchester. The study will be titled: 'Examining people's reaction to virtual games' and will be advertised on the university's student intranet. Students able to take part in the study will be awarded credits for their study at the university and will automatically be entered into a prize draw for Amazon vouchers (£50). The main inclusion criterion will be that participants are aged ≥18 years. Participants with a history of severe mental health problems (e.g., schizophrenia, bipolar disorder, affective psychosis), previous admission to a psychiatric hospital and on psychiatric medication will be excluded. In order to gain reliable and valid results participants will not be informed that the study is about beliefs about paranoia until completion of testing.

POWER CALCULATION/EXPECTED NUMBER OF PARTICIPANTS

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

With 50 participants in each group (100 total participants) the study will have 80% power to detect effect sizes of at least 0.566 between both groups.

The power calculations are based on comparing between-subject means between two groups using a two-sample t-test at the conventional two-sided 5% significance level (alpha 0.05). This assumes that the outcome means are normally distributed. The effect size is defined as the difference in means divided by the common standard deviation. The sample size calculations were performed using nQuery Advisor 7.0.

In addition with 100 participants the study will have reasonable power to detect differences for a maximum of 10 independent predictors in an analysis of covariance (ANCOVA) model, using the conventional 10:1 rule for number of participants to number of predictors.

MEASURES

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

1. Paranoia Checklist (Freeman et al. 2005). This 18-item measure has been designed to investigate paranoid thoughts and to provide a multi-dimensional assessment of paranoid ideation.
2. Peters Delusions Inventory (Peters, Joseph, & Garety, 1999). This 21-item measure has been developed to assess delusional ideation in the general population.
3. Beliefs about Paranoia Scale – Short form (Gumley, Gillan, Morrison, Schwannauer, 2010). This is an 18-item self-report measure that has been developed to assess metacognitive beliefs about paranoia in the general population.
4. Metacognitions Questionnaire – 30 (Wells & Cartwright-Hatton, 2004). This is a shortened 30-item version of the MCQ and measures individual differences in metacognitive beliefs, judgements and monitoring tendencies.
5. The Persecution and Deservedness Scale (Melo, Corcoran, Shryane & Bentall, 2009). This 10-item measure has been developed to assess persecutory ideation and associated deservedness.
6. State-Trait Anxiety Inventory (Spielberger, Gorsusch, Lushene, Vagg & Jacobs, 1983). This is a measure of state and trait anxiety.
7. Screening form to determine eligibility.

PROCEDURE

Describe the study's practical procedure.

Students who meet the inclusion criteria will be contacted via email and invited to Zochonis building in order to take part in the study. On arrival, participants will be invited to provide informed consent and will be informed that they can discontinue the experiment at any time. Participants will be exposed to a specific definition of paranoia (Freeman & Garety, 2000) before completing assessments of metacognitive beliefs, trait and state paranoia and distress before being randomised to the PBPG or NBPG. Participants in the first group will receive information about the benefits of paranoia whilst participants in the second group will receive information about the dangerous and harmful effects of paranoia via pre-recorded podcasts. These will be developed in collaboration with Dr. Paul French). Following this, all participants will enter the paranoia induction stage. Paranoia will be induced using Cyberball (Williams, Cheung & Choi, 2000) and a task feedback paradigm (Kestling, Bredenpohl, Klenke, Westermann & Lincoln, 2013). This paradigm has been found to evoke feelings of social exclusion and criticism assumed to be predominant in paranoia (Kestling et al. 2013). Participants will be re-assessed on the same measures. Testing will last for approximately 30-40 minutes. After the experiment participants will be fully debriefed (see below).

STATISTICAL ANALYSIS

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

Descriptive statistics will be performed to characterise the sample and check for baseline balance between the 2 groups. Analyses of covariance will be performed using the group allocation as grouping factor, distress or frequency of paranoia as the dependent variable and baseline variables as covariates.

Continuous data will be assessed for normality prior to analyses, and skewed data normalised using logarithmic transformation if suitable. For data that cannot be normalised, appropriate non-parametric analyses methods will be used.

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

Analogue research is commonly used to identify causal factors and make inferences about psychological processes in clinical populations. The continuum perspective makes the prediction that nonclinical persecutory ideation is likely to be related to delusional experiences (Freeman et al. 2005). Thus, studying non-clinical paranoid experiences informs the understanding of clinical paranoia (Freeman, Gittins, Pugh, Antley, Slater & Dunn, 2008). This study is an attempt to build on our understanding of a metacognitive model of paranoia with potentially important implications for its conceptualisation, assessment and treatment.

The research design of this study could be strengthened by recruitment of a persecutory delusions group. This idea was abandoned following a discussion with the Community Liaison Group during which the ethics of inducing paranoia to a group of people already experiencing paranoia were considered.

It is worth mentioning that paranoia induction paradigms have been used widely in the study of paranoia both with clinical and non-clinical populations (Freeman et al. 2005; Ellett & Chadwick, 2007; Freeman et al. 2008; Freeman, 2008; Green et al. 2012; Valmaggia et al.

2012; Westermann, Kesting & Lincoln, 2012; Kestling et al. 2013). To date, the author has not come across any reports in the literature of unwanted and / or harmful side effects associated with paranoia induction paradigms or with metacognitive beliefs manipulation. Therefore, follow up assessments to determine any adverse reaction to the procedure will not be conducted. Debriefing will include providing participants with normalising information about paranoia. The experimenter will make sure that the participants are not distressed when they leave the experiment and will provide them with pocket-sized laminated cards with various help-line numbers (e.g., Samaritans, Saneline) as well as with the contact details of the local A&E department.

COSTS

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

- Photocopying of measures: £10
- Laminated pocket sized cards: £10
- Two £50 vouchers: £100
-Sealed envelope: £95
- Presentation at the BABCP2015 summer conference: £175 registration.

Total= £390

QUESTIONS FOR THE COMMITTEE

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

1. I would appreciate it if you could consider the ethics and feasibility (i.e., in terms of recruitment) of recruiting a high non-clinical paranoia group.
2. Benefits of immediate debrief versus using a diary measure for sustained data collection.

DIFFICULTIES

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

1. It is possible that the metacognitive beliefs manipulation and/or paranoia induction manipulation checks 'fail'. The experimenter will pilot the paradigm prior to conducting the study. If the manipulation and induction fail then correlational analyses will be used (see contingency plan).

2. Confounds will be identified in the preliminary analysis.

3. Analogue research is increasingly being used in the field of psychosis research, however the use of non-clinical participants in this study limits the generalisability of findings to clinical populations.

4. Although adverse side effects in relation to paranoia induction have not been noted in the literature, this cannot be ruled out. The experimenter will ensure that participants are debriefed, offered normalising information in relation to paranoia and if necessary, supported to access relevant services. If risk to self and/or others is identified, the experimenter will conduct a thorough clinical risk assessment and depending on the risk identified follow a predesigned risk protocol.

KEY REFERENCES

Bentall, R.P., Kinderman, P., & Kaney, S. (1994). The self, attributional process and abnormal beliefs: Towards a model of persecutory delusions. *Behaviour Research and Therapy, 32,* 331-341.

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Peters, E.R., Joseph, S.A., Garety, P.A., (1999). Measurement of delusional ideation in the normal population: Introducing the PDI (Peters et al. Delusions Inventory). *Schizophrenia Bulletin, 25*(3)*: 553-576.*

Spielberger, C.D., Gorsusch, R.L., Lushene, R., Vagg P.R., & Jacobs, G.A. Manual for the state-trait anxiety inventory. Consulting psychologists press, Inc.; Palo Alto, CA (1983).

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

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How emotion regulation deficits in paranoia-prone individuals affect state paranoia during experimentally induced social stress. *Behaviour Therapy, 43,* 329-340.
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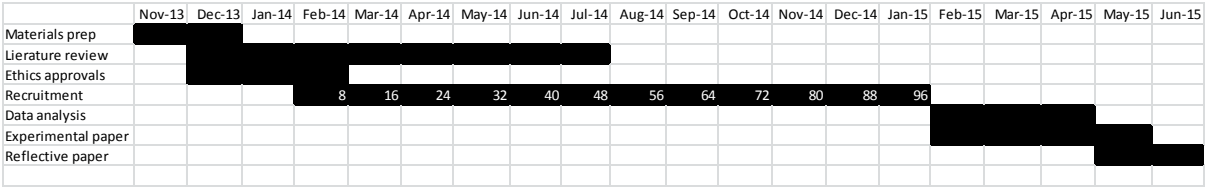
TIME BUDGET

Plan showing how time is accounted for.



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

Paranoia is a common experience. In fact, paranoia may be almost as common as depression or anxiety, with one third of the UK population regularly experiencing suspicious thoughts. Most of those people aren't very troubled by their suspicious thoughts, but 3-5% will have quite severe paranoia and will need specialist treatment.

Over the past twenty years, research has identified a number of factors involved in the occurrence of suspicious thoughts. Some researchers suggest that these thoughts can be caused by a combination of stress and major life events as well as negative feelings such as anxiety and depression. For example, often when we are anxious we tend to overestimate the chance of threat. Therefore, the way we feel has a big influence on the way we think. However, another line of research suggests that the way we think about paranoia may also be important. For example, if we believe that paranoia is harmful and/or dangerous we may feel distressed by its presence and engage with paranoia in a way to keep it at bay. Unfortunately, these strategies often backfire and increase our paranoia and distress. If, on the other hand, we think of our paranoia as helpful for example in terms of our safety, then understandably we may choose to engage with it. Therefore, the way that we think about paranoia is very important as it may have an impact on our experience of paranoia and distress.

With the present study we are hoping to explore this very idea. However, instead of studying people who are already experiencing paranoia we will conduct an experiment with students at the University of Manchester. Specifically, we will advertise our study to all psychology students and those willing to participate will be contacted. We will randomly assign participants to two different groups. The first group will receive information about paranoia being helpful (positive group), whilst the second group will receive information about paranoia being unhelpful (negative group). Following this, participants will be invited to play a computer game designed to induce paranoid thinking. Participants will complete several questionnaires throughout the study. From the results, we are interested in finding out whether the negative group will experience more distress than the positive group. If this is the case, then we can focus on developing treatments that will help people with paranoia think about their experience in ways that do not lead to more paranoia and distress.

CONTINGENCY PLAN

1. If the manipulation is not effective in producing a between-group difference, correlational analysis will still offer a method of assessing a relationship between metacognitive beliefs and frequency / distress associated with paranoia.

2. The researcher will explore the possibility of online manipulation and administration to aid recruitment. Recruitment will be regularly reviewed against the GANNT chart above. If recruitment falls below 50% of expected after 3 months, then alternative possible recruitment sources (i.e., staff) will be explored.

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:

(x) 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 J: Revised research proposal

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	Maria Kaltsi
Title of Project	Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population
Supervisor(s) Academic	Professor Anthony Morrison and Dr Sandra Bucci
Clinical/Field	N/A

INTRODUCTION

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

Paranoid or persecutory delusions are one of the most frequent symptoms of psychosis (Freeman, Garety, Kuipers, Fowler & Bebbington, 2002), and tend to be distressing or disruptive for the individual experiencing them (Freeman, Freeman & Garety, 2006). Paranoia has been defined as a belief that 'harm is occurring, or is going to occur, and that the persecutor has the intention to cause harm' (Freeman & Garety, 2000). Several cognitive theories account for the occurrence of paranoia. Bentall and colleagues conceptualise persecutory delusions as an attributional defence that serves to protect against low-self esteem in normal individuals (Bentall, Kinderman & Kaney, 1994). Their theory suggests that by making external attributions for negative events, rather than blaming the self, negative thoughts about the self are prevented from reaching awareness, thereby preserving an individual's self-esteem. The problem with this mechanism however, is that it leads to the activation of schemata that represent threats from others. Evidence in support of the relationship between self-esteem and paranoid ideation is conflicting. For example, Chadwick & Lowe (1994) found that self-esteem does not decrease when persecutory delusions improve, whilst Freeman et al. found low self-esteem is common in people with persecutory delusions. Trower and Chadwick's (1995) theory of two types of paranoia ('poor me' and 'bad me') provides a framework for understanding the contradictory evidence on persecutory delusions. According to the authors, people with 'poor me' paranoia tend to see themselves as victims and blame others. People with 'bad me' paranoia tend to blame themselves and to view others as justifiably punishing them. Freeman et al.'s (2002) theory of persecutory delusions incorporates Bentall et al.'s concept of attributional bias but argue that persecutory delusions are a reflection of the individual's experience of anxiety and not a defence. Wells and Matthews' (1994) self-referent executive function (S-REF) model has also provided a useful framework for understanding vulnerability to paranoia. This model suggests that metacognitive beliefs about mental experiences are important in psychological dysfunction. The S-REF proposes that metacognitive beliefs drive self-focused attention and ruminative processes, worry and the interpretation of events. It predicts that positive beliefs about mental events will be associated with an increase in frequency, whereas negative beliefs about such experiences will be associated with distress and disability. In order to explore the role of metacognition in paranoia, Morrison et al. (2005; 2011) examined the above predictions both in a clinical and non-clinical population group, and found results consistent with the S-REF. Specifically, they found positive and negative beliefs about paranoia to be associated with the experience of paranoia, and negative beliefs about paranoia to be associated with distress associated with delusional ideation. These findings offer some tentative support for a metacognitive model of clinical paranoia. However, the nature of the design meant that the

authors could not make causal inferences. The present study will aim to address some of the methodological limitations reported by Morrison et al. (2011) by exploring the causal role of metacognitive beliefs on paranoia frequency and distress utilising an experimental design.

AIMS & HYPOTHESES

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

This study will use an experimental design to assess the impact of metacognitive beliefs about paranoia on paranoia frequency and distress associated with paranoia in a non-clinical population. Specifically, this study will be testing the following hypotheses:

3. Participants in the negative beliefs about paranoia group (NBPG) will score higher than participants in the positive beliefs about paranoia group (PBPG) on measures of distress associated with paranoid thinking.
4. Participants with positive beliefs about paranoia will score higher than participants with negative beliefs on paranoia frequency.

METHOD

EXPERIMENTAL DESIGN

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

The experiment will be conducted as a randomised group comparison. Independent variable: Group (two levels: positive beliefs/negative beliefs). Dependent variables: Frequency of paranoia; paranoia associated distress.

At baseline, participants will be assessed with regard to their metacognitive beliefs, trait and state paranoid ideation, paranoia associated distress and other relevant variables such as anxiety and deservedness of paranoia. Participants will then be randomised **(stratified by trait paranoia)** to the PBPG or NBPG using sealedenvelope.com. Following the manipulation the highest loading items on positive/survival beliefs and negative beliefs from the BAPS (state version) will be re-administered and will serve as a manipulation check questionnaire. The state-adapted instruction will be 'How strongly do the following thoughts apply to you *at the moment?* All participants will then enter the paranoia induction stage. Finally, participants will be reassessed with regard to metacognitions, state paranoia and distress.

PARTICIPANTS

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

All participants will be recruited at the University of Manchester. The study will be titled: 'Examining people's reaction to virtual games' and will be advertised on the university's student intranet. Students who are able to take part in the study will be awarded credits for their study at the university and will automatically be entered into a prize draw for Amazon vouchers (£50). **The main inclusion criterion is: aged ≥18 years. Participants with a history of severe mental health problems (e.g., schizophrenia, bipolar disorder, affective psychosis), current use of secondary services (e.g., CMHT, EIS), and on psychiatric medication will be excluded from the present study. Specifically, in order to screen for the above criteria participants will be asked the following questions. Anyone who responds 'yes' will be deemed ineligible to participate in the study:**

1. Have you ever been hospitalised for assessment and/or treatment of schizophrenia, bipolar disorder, a psychosis-related problem (e.g. depression with psychosis, etc.)?

2. Have you ever been given a diagnosis for any of the above?

3. Have you ever been advised to take medication for hearing voices, paranoia or unusual thoughts?

4. Was there ever a period in your life when you were receiving support from an Early Intervention Service?

In order to gain reliable and valid results participants will not be informed that the study is about beliefs about paranoia until completion of testing.

POWER CALCULATION/EXPECTED NUMBER OF PARTICIPANTS

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

With **55 participants** in each group **(110 total participants)** the study will have 80% power to detect effect sizes of at least 0.566 between both groups.

The power calculations are based on comparing between-subject means between two groups using a two-sample t-test at the conventional two-sided 5% significance level (alpha 0.05). This assumes that the outcome means are normally distributed. The effect size is defined as the difference in means divided by the common standard deviation. The sample size calculations were performed using nQuery Advisor 7.0.

In addition with 110 participants the study will have reasonable power to detect differences for a maximum of 10 independent predictors in an analysis of covariance (ANCOVA) model, using the conventional 10:1 rule for number of participants to number of predictors. In order to achieve a sample size of a 110 it is conservatively estimated that 1 in 4 individuals expressing interest in the study may need to be excluded on the basis of the criteria listed above (A. P. Morrison, personal communication, September, 27, 2013).

MEASURES

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

1. Paranoia Checklist (Freeman et al. 2005). This 18-item measure has been designed to investigate paranoid thoughts and to provide a multi-dimensional assessment of paranoid ideation.
2. Peters Delusions Inventory (Peters, Joseph, & Garety, 1999). This 21-item measure has been developed to assess delusional ideation in the general population.
3. Beliefs about Paranoia Scale – Short form (Gumley, Gillan, Morrison, Schwannauer, 2010). This is an 18-item self-report measure that has been developed to assess metacognitive beliefs about paranoia in the general population.
4. Metacognitions Questionnaire – 30 (Wells & Cartwright-Hatton, 2004). This is a shortened 30-item version of the MCQ and measures individual differences in metacognitive beliefs, judgements and monitoring tendencies.
5. The Persecution and Deservedness Scale (Melo, Corcoran, Shryane & Bentall, 2009). This 10-item measure has been developed to assess persecutory ideation and associated deservedness.
6. State-Trait Anxiety Inventory (Spielberger, Gorsusch, Lushene, Vagg & Jacobs, 1983). This is a measure of state and trait anxiety.
7. Screening form to determine eligibility (as above).

PROCEDURE

Describe the study's practical procedure.

Students who meet the inclusion criteria will be contacted via email and invited to the Zochonis building to complete the study. On arrival, participants will be invited to provide informed consent and will be informed that they can discontinue the experiment at any time.

Participants will be exposed to a specific definition of paranoia (Freeman & Garety, 2000) before completing assessments of metacognitive beliefs, trait and state paranoia and distress. They will then be randomised to the PBPG or NBPG. Participants in the first group will receive information about the benefits of paranoia whilst participants in the second group will receive information about the dangerous and harmful effects of paranoia via pre-recorded podcasts. These will be developed in collaboration with Dr. Paul French. Following this, all participants will enter the paranoia induction stage. Paranoia will be induced using Cyberball (Williams, Cheung & Choi, 2000) and a task feedback paradigm (Kestling, Bredenpohl, Klenke, Westermann & Lincoln, 2013). This paradigm has been found to evoke feelings of social exclusion and criticism assumed to be predominant in paranoia (Kestling et al. 2013). Participants will be re-assessed on the same measures. Testing will last for approximately 60 minutes. After the experiment participants will be fully debriefed (see below).

STATISTICAL ANALYSIS

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

Continuous data will be assessed for normality prior to analyses, and skewed data normalised using logarithmic transformation if suitable. For data that cannot be normalised, appropriate non-parametric analyses methods will be used.

Descriptive statistics will be performed to characterise the sample and check for baseline balance between the 2 groups. Analyses of covariance will be performed using the group allocation as grouping factor, distress or frequency of paranoia as the dependent variable and baseline variables as covariates.

The primary analysis will include all randomised participants. Furthermore, a sensitivity analysis, which will be of secondary interest, will allow us to look for patterns in a subset of participants. This subgroup will consist of participants with an increase in positive or negative beliefs as measured by the BAPS.

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

Analogue research is commonly used to identify causal factors and make inferences about psychological processes in clinical populations. The continuum perspective predicts that non-clinical persecutory ideation is likely to be related to delusional experiences (Freeman et al. 2005). Thus, studying non-clinical paranoid experiences informs the understanding of clinical paranoia (Freeman, Gittins, Pugh, Antley, Slater & Dunn, 2008). This study is an attempt to build on our understanding of a metacognitive model of paranoia with potentially important implications for its conceptualisation, assessment and treatment.

The research design of this study could be strengthened by recruiting a group of people with persecutory delusions. This idea was abandoned following a discussion with the Community Liaison Group during which the ethics of inducing paranoia to a group of people already experiencing paranoia were considered.

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COSTS

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

- Photocopying of measures: £10
- Laminated pocket sized cards: £10
- Two £50 vouchers: £100
- Sealed envelope: £95
- Presentation at the BABCP 2015 summer conference: £175 registration.

Total= £390

QUESTIONS FOR THE COMMITTEE

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

3. ~~I would appreciate it if you could consider the ethics and feasibility (i.e., in terms of recruitment) of recruiting a high non-clinical paranoia group.~~
4. ~~Benefits of immediate debrief versus using a diary measure for sustained data collection.~~

DIFFICULTIES

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

1. It is possible that the metacognitive beliefs manipulation and/or paranoia induction manipulation checks 'fail'. The experimenter will pilot the paradigm prior to conducting the study. If the manipulation and induction fail then correlational analyses will be used (see contingency plan).

2. Confounding factors (i.e., anxiety) will be included in the ANCOVA.

3. Analogue research is increasingly being used in the field of psychosis research, however the use of non-clinical participants in this study limits the generalisability of findings to clinical populations.

4. Although adverse side effects in relation to paranoia induction have not been noted in the literature, this cannot be ruled out. The experimenter will ensure that participants are debriefed, offered normalising information in relation to paranoia and if necessary, supported to access relevant services. If risk to self and/or others is identified, the experimenter will conduct a thorough clinical risk assessment and depending on the risk identified follow a pre-designed risk protocol.

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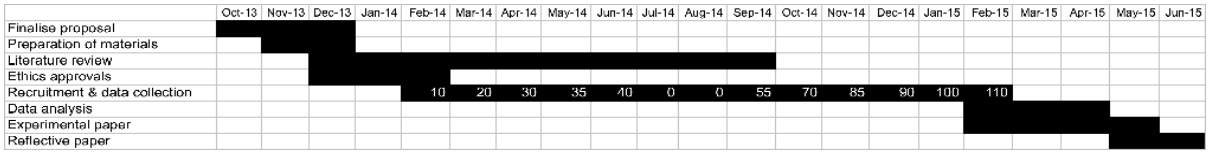
TIME BUDGET

Plan showing how time is accounted for.



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

Paranoia is a common experience. In fact, paranoia may be almost as common as depression or anxiety, with one third of the UK population regularly experiencing suspicious thoughts. Most of those people aren't very troubled by their suspicious thoughts, but 3-5% will have quite severe paranoia and will need specialist treatment.

Over the past twenty years, research has identified a number of factors involved in the occurrence of suspicious thoughts. Some researchers suggest that these thoughts can be caused by a combination of stress and major life events as well as negative feelings such as anxiety and depression. For example, often when we are anxious we tend to overestimate the chance of threat. Therefore, the way we feel has a big influence on the way we think. However, another line of research suggests that the way we think about paranoia may also be important. For example, if we believe that paranoia is harmful and/or dangerous we may feel distressed by its presence and engage with paranoia in a way to keep it at bay. Unfortunately, these strategies often backfire and increase our paranoia and distress. If, on the other hand, we think of our paranoia as helpful for example in terms of our safety, then understandably we may choose to engage with it. Therefore, the way that we think about paranoia is very important as it may have an impact on our experience of paranoia and distress.

With the present study we are hoping to explore this very idea. However, instead of studying people who are already experiencing paranoia we will conduct an experiment with students at the University of Manchester. Specifically, we will advertise our study to all psychology students and those willing to participate will be contacted. We will randomly assign participants to two different groups. The first group will receive information about paranoia being helpful (positive group), whilst the second group will receive information about paranoia being unhelpful (negative group). Following this, participants will be invited to play a computer game designed to induce paranoid thinking. Participants will complete several questionnaires throughout the study. From the results, we hope to find out whether the negative group will experience more distress than the positive group. If this is the case, then we can focus on developing treatments that will help people with paranoia think about their experience in ways that do not lead to more paranoia and distress.

CONTINGENCY PLAN

1. If the manipulation is not effective in producing a between-group difference, correlational analysis will still offer a method of assessing a relationship between metacognitive beliefs and frequency / distress associated with paranoia. **In addition, a sensitivity analysis (see statistical analysis) will be performed including only individuals with a successful manipulation. A successful manipulation is defined as where post-test scores are greater than baseline scores on relevant BAPS items (i.e., items 1, 3, 10 and 12).**

2. ~~The researcher will explore the possibility of online manipulation and administration to aid recruitment.~~ Recruitment will be regularly reviewed against the GANNT chart above. If recruitment falls below 50% of expected after 3 months, then alternative possible recruitment sources (i.e. staff) will be explored.

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:

(x) 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 K: Subcommittee approval

LSRP

Tracey Hepburn

To: Maria Kaltsi

Cc: Anthony Morrison; Sandra Bucci; Sara Tai; James Mcmanus

Tuesday, January 28, 2014 2:08 PM

Dear Maria

Thank you for your revised research proposal which was considered by chairs action. The committee were satisfied that the revisions made were appropriate and in accordance with the feedback from the meeting of 18th December action and you may now proceed with your research as set out in your revised proposal subject to you amending your protocol to give researcher (ie, yourself) the prerogative to stop the study if they believe a participant is being distressed. A copy of the amended protocol should be lodged with the programme secretary and in your research master file.

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)

A hard copy of this letter will be posted to you today.

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 L: Research ethics committee application

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 form the Research Ethics Office.

SECTION A – Administrative information

1. Title of the research: Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population

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

	Student	Supervisor/Staff
Title	Miss	Professor
Surname	Kaltsi	Morrison
First name	Maria	Tony
Post		Professor of Clinical Psychology
Qualifications	PGDip/PGCert Cognitive Behavioural Therapy, M.Sc. Rehabilitation Psychology, BSc(Hons) Psychology	PhD, ClinPsyD
School/Unit	School of Psychological Sciences	School of Psychological Sciences
Contact Address	2nd Floor, Zochonis Building, University of Manchester, Brunswick street, M13 9PL	2nd Floor, Zochonis Building, University of Manchester, Brunswick street, M13 9PL
Email address	maria.kaltsi@postgrad.manchester.ac.uk	Anthony.p.morrison@manchester.ac.uk tonymorrison@ntlworld.com
Telephone	XXX	XXX

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 (ClinPsyD)

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: June 2014
   End date: March 2015
7. **Where will the data collection take place?**

University of Manchester premises

8. **What is the principal research question?**

Does experimental manipulation (induction of paranoia) of positive and negative beliefs about paranoia lead to an increase in paranoia frequency and distress?

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

Paranoia is a common experience. In fact, paranoia may be almost as common as depression or anxiety, with one third of the UK population regularly experiencing suspicious thoughts. Most of those people aren't very troubled by their suspicious thoughts, but 3-5% will have quite severe paranoia and will need specialist treatment.

Over the past twenty years, research has identified a number of factors involved in the occurrence of suspicious thoughts. Some researchers suggest that these thoughts can be caused by a combination of stress and major life events as well as negative feelings such as anxiety and depression. For example, often when we are anxious we tend to overestimate the chance of threat. Therefore, the way we feel has a big influence on the way we think. However, another line of research suggests that the way we think about paranoia may also be important. For example, if we believe that paranoia is harmful and/or dangerous we may feel distressed by its presence and engage with paranoia in a way to keep it at bay. Unfortunately, these strategies often backfire and increase our paranoia and distress. If, on the other hand, we think of our paranoia as helpful for example in terms of our safety, then understandably we may choose to engage with it. Therefore, the way that we think about paranoia is very important as it may have an impact on our experience of paranoia and subsequent distress.

With the present study we are hoping to explore this very idea. However, instead of studying people who are already experiencing paranoia we will conduct an experiment with students at the University of Manchester. Specifically, we will advertise our study to all psychology students and those willing to participate will be contacted. We will randomly assign participants to two different groups. The first group will receive information about paranoia being helpful (positive group), whilst the second group will receive information about paranoia being unhelpful (negative group). Following this, participants will be invited to play a computer game designed to induce paranoid thinking. Participants will complete several questionnaires throughout the study. From the results, we hope to find out whether the negative group will experience more distress than the positive group. If this is the case, then we can focus on developing treatments that will help people with paranoia think about their experience in ways that do not lead to more paranoia and distress.

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 experimental manipulation of negative (e.g., paranoia is harmful / dangerous) and positive (e.g., paranoia is helpful) beliefs about paranoia will be related to an increase in paranoid thoughts and distress associated with such beliefs. It is hypothesised that an increase in negative beliefs about paranoia will result in an increase in distress associated with paranoia. It is also hypothesised that an increase in positive beliefs about paranoia will result in an increase of paranoid thoughts. In addition, the secondary aim is to explore associations between the metacognitive factors of the MCQ and paranoid thinking.

Procedure:

1. Screening, written consent and baseline measures

2. Randomisation (stratified by trait paranoia): allocation to either the PBPG or NBPG

3. Manipulation of metacognitive beliefs: Participants in the PBPG will receive information about the benefits of paranoia whilst participants in the NBPG will receive information about the dangerous and harmful effects of paranoia via pre-recorded podcasts.

4. Manipulation check: Beliefs about Paranoia questionnaire

5. Paranoia induction stage. Paranoia will be induced using Cyberball (Williams, Cheung & Choi, 2000) and a task feedback paradigm (Kestling, Bredenpohl, Klenke, Westermann & Lincoln, 2013).

6. Outcome measures

7. 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 part of the Doctorate in Clinical Psychology programme, University of Manchester. 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 conta ct 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.

Continuous data will be assessed for normality prior to analyses, and skewed data normalised using logarithmic transformation if suitable. For data that cannot be normalised, appropriate non-parametric analyses methods will be used (e.g. Mann-Whitney U test).

Descriptive statistics will be performed to characterise the sample and check for baseline balance between the 2 groups. Analyses of covariance will be performed using the group allocation as grouping factor, distress or frequency of paranoia as the dependent variable and baseline variables as covariates.

The primary analysis will include all randomised participants. Furthermore, a sensitivity analysis, which will be of secondary interest, will allow us to look for patterns in a subset of participants. This subgroup will consist of participants with an increase in positive or negative beliefs as measured by the BAPS.

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

Paranoia induction paradigms are safe techniques that have been used to investigate paranoid ideation not only in the general population (Freeman et al. 2005; Freeman et al. 2008; Green et al. 2011; Freeman, Gittins, Pugh, Antley Slater & Dunn, 2012), but also in clinical samples. Specifically, Valmaggia et al. (2007) and Freeman (2008) have conducted studies using paranoia paradigms (i.e., virtual reality) with both subclinical (i.e., 'at-risk mental state' for psychosis) and clinical populations (i.e., schizophrenia) without noting any adverse effects. Despite the above, the present study will still implement robust procedures with regard to the process of debriefing. Specifically, participant information sheets will include signposting to local services i.e., University Student Services, NHS Direct, the Samaritans, Mind, Rethink. 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 to those who report distress. Following the study all participants will be provided with normalising information around psychosis-like experiences.

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)*

110 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)*

1. English-speaking (as the questionnaire measures are not validated in other languages)

2. 18 years old or above

3. Normal/ corrected vision and hearing (to ensure audio and computer task can be completed)

18.What are the principal exclusion criteria for participants? *(Please justify)*
Participants with a history of severe mental health problems (e.g., schizophrenia, bipolar disorder, affective psychosis), current use of secondary services (e.g., CMHT, EIS), and on psychiatric medication will be excluded from the present study. Specifically, in order to screen for the above criteria participants will be asked the following questions. Anyone who responds 'yes' will be deemed ineligible to participate in the study:

1. Have you ever been hospitalised for assessment and/or treatment of schizophrenia, bipolar disorder, a psychosis-related problem (e.g. depression with psychosis, etc.)?

2. Have you ever been given a diagnosis for any of the above?

3. Have you ever been advised to take medication for hearing voices, paranoia or unusual thoughts?

4. Was there ever a period in your life when you were receiving support from an Early Intervention Service?

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. Potential participants will be provided with the study information sheet via email and given at least 24 hours to consider this prior to screening and written consent. Ineligible participants will be thanked for their time.

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 offer any direct benefit to participants. However, we are hoping that the results will increase our understanding of the aetiology of paranoia with potentially important implications for its conceptualisation, assessment and treatment. Analogue research is commonly used to identify causal factors and make inferences about psychological processes in clinical populations. The continuum perspective predicts that non-clinical persecutory ideation is likely to be related to delusional experiences (Freeman et al. 2005). Thus, studying non-clinical paranoid experiences informs the understanding of clinical paranoia (Freeman, Gittins, Pugh, Antley, Slater & Dunn, 2008).

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 and given at least 24 hours to consider this prior to screening and written consent.

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 audio 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:

2. Randomisation: allocation to either the PBPG or NBPG

3. Manipulation of metacognitive beliefs: Participants in the PBPG will receive information about the benefits of paranoia whilst participants in the NBPG will receive information about the dangerous and harmful effects of paranoia via pre-recorded podcasts.

4. Manipulation check: Beliefs about Paranoia questionnaire

5. Paranoia induction stage. Paranoia will be induced using Cyberball (Williams, Cheung & Choi, 2000) and a task feedback paradigm (Kestling, Bredenpohl, Klenke, Westermann & Lincoln, 2013).

6. Outcome measures

7. 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 paranoia literature has not reported any side effects associated with paranoia induction paradigms. Despite that, the present study will implement robust procedures with regard to the process of debriefing. Specifically, participant information sheets will include signposting to local services i.e., University Student Services, NHS Direct, the Samaritans, Mind, Rethink. 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. 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

<u>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)</u>

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 the data provided by that participant during the study. 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 un dertaken?

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):

_____ _____
SIGNATURE DATE

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

---------- **_____**
SIGNED BY OR ON BEHALF OF HEAD OF SCHOOL
Date

NAME (PLEASE PRINT)

Appendix M: Research ethics committee approval

The University of Manchester

Faculty of Medical and Human Sciences
The University of Manchester
Oxford Road
Manchester M13 9PT

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www.manchester.ac.uk

Secretary to Research Ethics Committee 1

Email: Katy.boyle@manchester.ac.uk
Phone : 0161 275 1360

Miss Maria Kaltsi
PhD Student
School of Psychological Sciences
Faculty of Medical and Human Sciences
University of Manchester
M13 9PL

maria.kaltsi@postgrad.manchester.ac.uk

ref: ethics/14191

8 August 2014

Dear Miss Kaltsi

Research Ethics Committee 1

Kaltsi, Morrison, Bucci: Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population (ref 14191)

I write to confirm that the amendments to the ethics application form, participant information sheet, consent form, advert and questionnaire, and the provision of a letter to the GP, documentation on deception and the links to the games / podcasts that will be used, satisfy the concerns of the Committee and that the above project therefore has ethical approval.

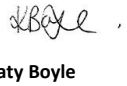
The general conditions remain as stated in the letter of 4th June 2014.

Finally, I would be grateful if you could complete and return the attached form at the end of the project or by June 2015, whichever is earlier. When completing this form, please reference your project as:

Kaltsi, Morrison, Bucci: Experimental manipulation of metacognitive beliefs and paranoia in a non-clinical population (ref 14191)

We do hope that your research goes well,

Yours sincerely,



Katy Boyle
Secretary to University Research Ethics Committee