The effects of mindfulness on paranoia, worry, rumination, and self-knowledge organisation

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Abstract

Paranoia, one of the positive symptoms of psychosis, is also highly prevalent and distressing in non-clinical populations which suggests that clinical paranoia exists on a continuum with non-clinical paranoia. Psychological interventions are therefore needed for distressing non-clinical paranoia and as an analogue for clinical paranoia. Mindfulness interventions that use Insight Meditation (IM), which focuses on observation and acceptance of internal experiences in a non-judgemental way while maintaining a focus on breathing, have shown promising effects in psychosis. Two preliminary studies suggest that Loving Kindness Meditation (LKM), which focuses on increasing social connection and kindness toward oneself and others, is effective for negative symptoms of psychosis. However, little is known about the effects of mindfulness interventions on non-clinical paranoia and its associated processes. Moreover, no study to date has compared IM to LKM in clinical or non-clinical paranoia. The current study used a randomised design to compare the effects of IM and LKM on paranoia outcomes (i.e. frequency of paranoid thoughts, associated distress, and state paranoia), on processes associated with paranoia (i.e. worry, rumination, repetitive negative thinking), and on a self-related process that is proposed to be relevant to paranoia, that is self-knowledge compartmentalisation. One hundred individuals from a non-clinical population who scored high on measures of trait paranoia and paranoia distress were randomised to practise either IM or LKM for 14 days. Outcomes were measured pre-intervention, post-intervention, and at 1-month follow-up. No significant differences were found between LKM and IM on the examined outcomes. Both mindfulness conditions showed highly significant improvements on all the outcomes from baseline to post-intervention, with the effects remaining highly

significant at 1-month follow-up. The effect sizes were large for paranoia outcomes, medium for worry, rumination and repetitive negative thinking, and small for self-knowledge compartmentalisation. The findings demonstrate the potential of IM and LKM as psychological interventions for distressing non-clinical paranoia. They also highlight the importance of verifying their effectiveness for persecutory delusions.

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1 Introduction

1.1 Overview

Paranoia is one of the positive symptoms of psychosis but is also highly prevalent and distressing in non-clinical populations, which supports the view that paranoia exists on a continuum with normal experience (Bebbington et al., 2013; Ellett, Lopes, & Chadwick, 2003; Freeman et al., 2005). Research suggests that paranoia is developed and maintained by common cognitive and affective factors, including a worry thinking style and self-related processes (Freeman & Garety, 2014; Tiernan, Tracey, & Shannon, 2014). Given the relevance of non-clinical paranoia as an analogue for clinical paranoia, but also given the prevalence, distress and psychological processes associated with non-clinical paranoia, it is important to identify psychological interventions that are effective in reducing distressing non-clinical paranoia. Preliminary studies suggest that mindfulness interventions that use Insight Meditation, which focuses on observation and acceptance of internal experiences in a non-judgemental way while maintaining a focus on breathing (Feldman, Greeson, & Senville, 2010), are promising for the positive symptoms of psychosis (Chadwick, 2014). Recently, Loving Kindness Meditation, which focuses on increasing social connection and kindness toward oneself and others, was also found to be promising for the negative symptoms of psychosis (Johnson et al., 2011). However, little is known about the effects of mindfulness interventions on non-clinical paranoia and its associated processes. Moreover, no study to date has compared Insight Meditation to Loving Kindness Meditation in clinical or non-clinical paranoia.

This chapter provides an overview of the literature related to non-clinical paranoia and mindfulness. It starts with a summary of the literature on non-clinical paranoia (i.e. definition, prevalence, distress, and associated processes), followed by literature on mindfulness-based interventions for psychosis, clinical, and non-clinical paranoia, and related processes. It concludes with a summary of the research gaps that the current study aims to address and presents the study hypotheses.

1.2 Non-clinical paranoia

1.2.1 Definition of paranoia

Paranoia has been traditionally conceptualised as a positive symptom of psychosis referring to the experience of persecutory delusions (DSM-IV; American Psychiatric Association, 2000). Freeman & Garety (2000) describe two criteria for defining persecutory delusions: "(A) the individual believes that harm is occurring, or is going to occur, to him or her, and (B) the individual believes that the persecutor has the intention to cause harm" (p. 412). Harm is defined as anything that the individual finds distressing and does not include delusions of reference (e.g. people are watching me) (Freeman & Garety, 2000). Harm can be physical, psychological, or social, and it can be of any severity as long as the individual finds it distressing (Freeman & Garety, 2000). This definition of paranoia has been employed in previous research on paranoia both with clinical and non-clinical populations (Ellett, 2013; Ellett & Chadwick, 2007; Ellett et al., 2003; Freeman et al., 2011), and therefore it will also be adopted in the current study.

The conceptualisation of paranoia as a positive symptom of psychosis has been in line with categorical and diagnostic systems of mental illness, such as *the Diagnostic and Statistical Manual of Mental Disorders* (DSM; American Psychiatric Association, 2000, 2013) and *the International Classification of Diseases* (ICD -10; World Health Organization, 2004), whereby distinct categories of mental disorders are defined based on the presence of discrete clinical symptoms. However, in recent years there has been a growing interest towards a dimensional view of psychotic symptoms where clinical symptoms are seen as existing on the higher severity end of a continuum of experiences ranging from fairly mild to severe (Linscott & Van Os, 2010; Van Os, Hanssen, Bijl, & Ravelli, 2000). For instance, a systematic review on the prevalence of psychotic symptoms in the general population suggests that 8% of the population report sub-clinical psychotic experiences, 4% report sub-clinical psychotic symptoms associated with some distress and help seeking but not meeting criteria for a clinical diagnosis of psychosis, whilst 3% meet criteria for a diagnosis of psychosis (Van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009).

Similarly, the theory that paranoid thoughts are on a continuum with normal experience is supported by a substantial amount of research which suggests that paranoid thoughts are common also in non-clinical populations, as it will be discussed below.

1.2.2 Prevalence of non-clinical paranoia

A significant number of research studies have examined the prevalence of paranoid thoughts in non-clinical samples suggesting that paranoid thoughts are not uncommon in non-clinical populations. One of the earliest studies in this area used a questionnaire to examine the

presence of paranoid ideation in 324 college students. The authors report that almost half of the sample reported an experience of paranoia including a statement of planned intention to harm (Ellett et al., 2003). Freeman and colleagues (2005) present data from a large questionnaire study with 1202 university students which suggest that paranoia encompasses a hierarchy of thoughts ranging on the one end from fairly frequent beliefs of social evaluative content (e.g. fears of rejection), followed by ideas of reference (e.g. people are talking about me) and on the other end by progressively less frequent beliefs of being under threat, which can range from mild (e.g. people trying to cause me minor distress) to severe (e.g. people are trying to cause me significant physical, psychological or social harm). A review of epidemiological studies on the prevalence of delusions in the general population suggests that delusional ideation (including of paranoid content) is reported by 10% to 15% of the non-clinical population whereas 1% to 3% of the non-clinical population report delusions of a level of severity comparable to clinical cases of psychosis (Freeman, 2006). Similarly, a cross-sectional survey study using data from the 2007 Adult Psychiatric Morbidity Survey in England with 7281 respondents found that 18.6% reported that people were against them, whilst 1.8% reported potential plots to cause them serious harm (Freeman et al., 2011). Another epidemiological study using data from the 2000 British National Psychiatric Morbidity Survey on the prevalence of paranoid thoughts in the general population confirmed the existence of a continuous distribution of paranoid beliefs in the general population with certain thoughts reflecting mistrust and interpersonal sensitivities being reported by almost 30% of the population and thoughts reflecting persecutory ideation representing a significant minority (Bebbington et al., 2013). Specifically, 9% reported that there had been times when they felt

that people were deliberately acting to harm them, whereas 1.5% reported that there had been times when they felt that people were plotting to cause them serious harm or injury (Bebbington et al., 2013).

The above data support existing calls in the literature for the use of non-clinical paranoia not only as an analogue for the study of clinical paranoia (Combs & Penn, 2004; Freeman & Garety, 2014), but also as a phenomenon of interest in its own right (Ellett, 2013; Ellett & Chadwick, 2007; Ellett et al., 2003).

1.2.3 Psychological distress associated with non-clinical paranoia

Several studies suggest that the experience of paranoid thoughts in non-clinical populations is not only common but also distressing, as suggested by empirical data on the associations of non-clinical paranoia with various mental health outcomes. For example, early studies of non-clinical paranoia found significant associations of higher levels of paranoid ideation with greater depressed mood, social anxiety (Martin & Penn, 2001) and lower self-esteem (Ellett et al., 2003). A study comparing two groups of participants, those high and those low in non-clinical paranoia, found that individuals who were high in non-clinical paranoia had greater depression, social anxiety, and lower self-esteem (Combs & Penn, 2004). A secondary analysis of data from a survey study of psychological morbidity in the British population, excluding individuals with probable diagnoses of psychosis, found strong correlations between the experience of paranoid thoughts and insomnia, anxiety, depression and irritability (Freeman et al., 2010). Another survey study of the concomitants of paranoia in the general population in the UK found that the experience of paranoid thinking was significantly associated with

anxiety, phobias, panic, post-traumatic stress, depression and insomnia (Freeman et al., 2011). In fact, the authors point out that anxiety was associated with an almost 10 times greater likelihood of the severest paranoid thinking (Freeman et al., 2011). The psychological distress associated with non-clinical paranoia is also supported by a survey study on the prevalence of paranoid thoughts in the general population which measured the distress experienced in relation to specific paranoid thoughts (Freeman et al., 2005). The study found that 3-34% of the respondents experienced some level of distress associated with specific paranoid thoughts, whilst 1-7% reported that they found paranoid thoughts very distressing (Freeman et al., 2005). Although the above studies are cross-sectional, and consequently cause and effect conclusions cannot be drawn, the data demonstrate a clear link between the experience of non-clinical paranoia and psychological distress.

1.2.4 Processes associated with non-clinical paranoia

As well as examining distress associated with non-clinical paranoid experiences, a significant amount of research also exists on the predictors and correlates of non-clinical paranoia. Coping strategies (e.g. worry, rumination, use of submissive behaviours, substances use), affective and cognitive processes (e.g. reasoning biases, anxiety, depression, self-esteem), and psychosocial factors (e.g. being single, poverty, poor physical health, poor social functioning, less perceived social support, stress at work, less social cohesion) have been shown to either predict or to be related to the occurrence of paranoia in non-clinical populations (Ellett & Chadwick, 2007; Freeman et al., 2002, 2008, 2011, 2013; Freeman & Garety, 2014, 1999; Garety & Freeman, 2013). Thε current study is concerned with two specific processes, a worry thinking style and self-related processes. The reason the current

study focuses on these two processes is because there is a strong evidence suggesting that they are involved in the development and maintenance of paranoia (Freeman & Garety, 2014; Tiernan et al., 2014). The relevant literature is discussed below.

1.2.4.1 Worry thinking style

A worry thinking style encompasses worry and rumination which are related constructs as they both refer to a process of repetitive thinking, albeit it has been proposed that they have different content (Watkins, Moulds, & Mackintosh, 2005). Rumination is usually conceptualised in relation to depression and is defined as a way of coping with symptoms of distress including repetitively thinking about one's depressive symptoms, their causes and consequences (Nolen-Hoeksema & Morrow, 1991). Worry is also a process of repetitive thinking but it is typically associated with generalised anxiety disorder (GAD) and is defined as a "chain of thoughts, and images, negatively affect-laden, and relatively uncontrollable" whereby the individual attempts to problem-solve a future issue with an uncertain outcome (Borkovec, Robinson, Pruzinsky, & DePree, 1983, p. 10). It has been proposed that worry and rumination share more similarities than differences, and that they are both aspects of a worry thinking style which is a trans-diagnostic process that is common in many mental health disorders (Ehring et al., 2011). Therefore, for the purposes of the thesis and in line with recent developments (Ehring et al., 2011), a worry thinking style is used to refer to both worry and rumination and is defined as a way of thinking about one's problems or negative experiences that is characterised by repetitive thinking which is partly intrusive and is difficult to disengage from (Ehring et al., 2011).

A worry thinking style has been implicated as a key process in the onset and maintenance of paranoia and paranoia distress (Chadwick, Birchwood, & Trower, 1996; Freeman & Garety, 2014, 1999). The threat anticipation model of paranoia suggests that as an individual that is prone to psychotic experiences tries to make sense of a confusing internal state (such as a hallucination, a perceptual abnormality, or arousal), certain cognitive, affective, and social factors contribute to a persecutory interpretation of the internal state with a worry thinking style being one of them (Freeman, 2007; Freeman et al., 2002). Moreover, Chadwick, Taylor, and Abba (2005) propose that distress experienced in relation to an unpleasant psychotic sensation such as a paranoid thought results from three cognitive and behavioural mechanisms, one of which is rumination.

The role of a worry thinking style in the development and maintenance of paranoid thoughts is supported by a significant amount of empirical data, including cross-sectional, longitudinal, experimental, and intervention studies. These are discussed below in order of study design. A cross-sectional questionnaire study comparing a group with Generalised Anxiety Disorder and a group with persecutory delusions on measures of worry found that the participants with persecutory delusions had worry scores similar to those of the Generalised Anxiety Disorder group (Freeman & Garety, 1999). Rumination was also found to explain a significant amount of variance of paranoid beliefs in a cross-sectional study with 133 undergraduate students (Simpson, MacGregor, Cavanagh, & Dudley, 2012). Longitudinal studies also support that a worry thinking style predicts the persistence of paranoia over time. For instance, a large longitudinal study of paranoid thinking in the British general population found that baseline worry, along with insomnia, were the strongest predictors of new

inceptions of paranoia and of the persistence of existing paranoid thoughts (Freeman et al., 2011). Another longitudinal study of 106 individuals who were physically assaulted found that worry one month post the assault was a highly significant predictor of paranoid thinking six months post the assault (Freeman et al., 2013). The role of a worry thinking style in the onset and maintenance of paranoia is also supported by experimental studies, such as one study where 200 members of the public spent four minutes in a virtual reality environment with neutral characters and were later asked to report their perceptions of the characters (Freeman et al., 2008). Rumination was also significantly associated with maintained levels of paranoid thinking in an experimental study which involved an induction of paranoia in a non-clinical sample of 37 individuals who were assigned to a rumination task or a distraction control condition (Martinelli, Cavanagh, & Dudley, 2013). Lastly, two recent Randomised Controlled Trials of psychological interventions that focused on worry management found that the interventions were effective in reducing both worry and persecutory delusions and that a large proportion of the effect of the interventions on persecutory delusions was mediated by the effect of the interventions on worry (Foster, Startup, Potts, & Freeman, 2010; Freeman et al., 2015).

In summary, there is a significant amount of empirical data from research studies with various methodological designs which support the theoretical proposition that a worry thinking style is a significant process both in the development and in the persistence of paranoid thoughts (Dunn, Startup, & Kingdon, 2015).

1.2.4.2 Self-related processes

The role of various self-related processes in the development and maintenance of paranoia is also supported by a substantial amount of research as this has been reviewed in a recent systematic review on the relationship between self-concepts and paranoia in psychosis (Tiernan et al., 2014). Self-concepts were defined broadly in the systematic review to include measures of global self-esteem, self-worth, specific self-evaluations and implicit self-esteem (i.e. non-conscious evaluations of the self) (Tiernan et al., 2014). The review found a consistent association of higher paranoia with more negative self-concepts in cross-sectional studies, even after controlling for various confounding variables such as depression, age, gender, and IQ (Tiernan et al., 2014).

Self-related processes have also been found to predict or to be associated with paranoia in non-clinical populations. For instance, a study reporting the psychometric properties of the Brief Core Schema Scales with a non-clinical sample and a sample of individuals with psychosis, found that negative self-evaluations were predictive of paranoia in the non-clinical sample along with anxiety and negative other-evaluations (Fowler et al., 2006). Negative beliefs about the self were also found to be associated with a predisposition to paranoia in a questionnaire study of 228 students (Gracie et al., 2007). In a series of experimental studies, Ellett and Chadwick (2007) found that increasing the participants' access to positive self-cognitions acted as a significant buffer to paranoid thinking. Another experimental study used virtual reality to manipulate height as a proxy of social rank in order to test the hypothesis that lowering individuals' height would increase paranoia and that this increase would be mediated by perceived changes in social comparison (i.e. perceiving oneself more negatively compared to others) (Freeman et al., 2014). The results of the study supported the above

hypothesis suggesting that paranoia develops from common perceptions of the self as vulnerable (Freeman et al., 2014). Lastly, a longitudinal questionnaire study of the associations of negative self-schemas with delusional thinking in 204 individuals from a non-clinical population found that negative self-schemas at Time 1 predicted delusional thinking 6 months later (Oliver, O'Connor, Jose, McLachlan, & Peters, 2012).

The above findings are in support of one of the key premises of the threat anticipation model of paranoia which postulates that paranoid thoughts often occur in the context of pre-existing negative beliefs about the self as vulnerable (Freeman, 2007). Freeman (2007) further argues that there is likely to be a circular relationship between negative self-beliefs and paranoia whereby pre-existing negative self-beliefs increase the likelihood of internal anomalous experiences being perceived suspiciously but also suspicious paranoid thoughts further contribute to the reinforcement of negative self-beliefs. Chadwick (2003) also proposes in relation to individuals with psychosis that:

> a fundamental challenge of working within a person model is to help a person move away from a model of the self as fixed, simplified and emotionally negative (a negative self-schema), towards a new metacognitive model of the self as complex, contradictory, changing and emotionally varied (Chadwick, 2003, p. 440).

To date, the existing research on self-related concepts and paranoia has focused on the content of the individuals' knowledge about the self (e.g. self-esteem, self-worth) (Tiernan et al., 2014). A distinct but related self-concept that has not yet been investigated in relation to

paranoia is how self-knowledge is organised. There are different aspects of self-knowledge organisation, such as differential importance (Pelham & Swann, 1989), self-complexity (Linville, 1987), and compartmentalisation (Showers, 1992; Showers, Abramson, & Hogan, 1998). The current study is concerned with the latter. The theoretical model of self-knowledge compartmentalisation and relevant literature are discussed below.

1.2.4.2.1 Self-knowledge compartmentalisation

Self-knowledge compartmentalisation is a feature of self-concept structure rather than self-concept content, as it is not concerned with the content of the individuals' self-beliefs but with the ways in which these are organised across different perceived aspects of the self (Showers, Ditzfeld, & Zeigler-Hill, 2015). Self-knowledge compartmentalisation refers to the degree of integration of negative and positive perceived attributes across different self-aspect categories, where the categories represent different domains, roles, experiences, states or traits of the self (e.g. student, taking tests, sister, being with friends, being alone) (Showers, 1992; Showers et al., 1998). The model of self-knowledge compartmentalisation identifies two ways in which the knowledge about the self is organised: integration and compartmentalisation (Showers, 1992; Showers et al., 1998). A compartmentalised organisation of self-knowledge refers to the situation whereby the individual identifies aspects of themselves or their lives that are characterised by purely positive or purely negative perceived attributes (Showers, 1992). For example, the individual describes their self as a scholar with only positive attributes such as curious, motivated, and interested, whereas they describe their self in relation to taking tests with only negative attributes such as tense, distracted, and insecure (Showers, 1992). On the contrary, an integrative organisation of self-

knowledge refers to the situation whereby the individual identifies aspects of themselves or their lives which are characterised by both positive and negative perceived attributes (Showers, 1992). For example, the individual describes their self in relation to attending humanities classes as motivated, distracted, insecure, creative, expressive, and moody (Showers, 1992). A person with compartmentalised self-aspects will experience the self as positive only or negative only depending on which self-aspect is activated at the time. On the contrary, a person with integrative self-aspects will experience the self as both positive and negative regardless of the self-aspect that is activated (Showers, Limke, & Zeigler-Hill, 2004).

The model predicts that when a person's positive perceived attributes and self-aspects are more salient, compartmentalised organisation will be associated with a more positive mood and higher self-esteem than will integrative organisation, because the positive compartmentalised organisation will prevent access to the negative perceived attributes and self-aspects. However, if a person's negative perceived attributes and self-aspects are more salient (or they become more salient due to stressful life events), compartmentalisation will increase the access to the negative self-beliefs, and therefore integrative organisation, which allows activation of both positive and negative self-beliefs, would be preferable for maintaining mood and self-esteem (Showers, 1992; Showers et al., 2015).

The model is supported by a few early studies on the relationship of self-knowledge organisation with mood and self-esteem. The seminal paper of self-knowledge organisation describes three studies examining the relationship between self-knowledge compartmentalisation, self-esteem, and depression in undergraduate students (Showers, 1992). The main finding was that higher compartmentalised self-knowledge was associated

with higher self-esteem and lower depression in individuals who rated their positive self-aspects as important, however it was associated with lower self-esteem and higher depression in individuals who rated their negative self-aspects as more important (Showers, 1992). Another study examining the relationship between self-knowledge compartmentalisation and narcissism found that narcissists with low integrative self-knowledge organisation had less stable self-esteem (Rhodewalt, Madrian, & Cheney, 1998). More recently, studies have also started looking at the relationship between self-knowledge compartmentalisation and distinct psychological disorders. For instance, Stopa, Brown, Luke, and Hirsch (2010) examined the concept of self-knowledge compartmentalisation in relation to bipolar disorder, and found that individuals with remitted bipolar disorder had higher levels of self-knowledge compartmentalisation than healthy controls. Similarly, Taylor Morley, and Barton (2007) report a study on the relationship of self-knowledge compartmentalisation with social anxiety, whereby the high socially anxious group reported higher levels of self-knowledge compartmentalisation than the low socially anxious group.

Showers and colleagues (2004) argue that self-knowledge organisation changes dynamically over time according to which self-aspects become more important. They propose that the most common self-knowledge structure for individuals will be positive compartmentalisation, whereby individuals tend to identify self-aspects that are characterised by positive only attributes (Showers et al., 2004). When negative attributes or negative self-aspects become more salient the individuals' self-knowledge will shift to a more integrative organisation in order to buffer the effects of these negative self-aspects (Showers et al., 2004). Once the negative self-aspects become less salient, the organisation will revert

to positive compartmentalisation in order to retain its benefits for mood and self-esteem (Showers et al., 2004).

One of the implications of the model is that psychological treatment which uses techniques that encourage more flexible ways of thinking will impact on mood and self-esteem by facilitating the development of more integrative self-knowledge organisation (Showers et al., 2004). A more integrative self-knowledge organisation is proposed to be a helpful coping strategy in the face of situations that prime one's negative self-aspects as it is protective for mood and self-esteem (Showers et al., 2004). Showers and colleagues argue that individuals who enter psychological treatment experience high levels of distress related to negative self-beliefs and a self-structure that is negative compartmentalised. Over the course of therapy, the individuals learn new strategies which allow more flexible ways of thinking which lead to a more integrative self-knowledge organisation and therefore improve psychological wellbeing (Showers et al., 2004).

This is particularly relevant for individuals who experience paranoia especially in the context of the existing evidence suggesting that there is a significant association of higher paranoia with more negative self-concepts (Tiernan et al., 2014). On the basis of the model, it would be expected that higher levels of paranoia would be associated with more negative compartmentalised self-knowledge. Moreover, psychological treatment that facilitates more flexible ways of thinking about the self will lead to a more integrative organisation of self-beliefs which is likely to be beneficial for the wellbeing of individuals with high levels of

paranoia. To the author's knowledge there is not any research linking the concept of self-knowledge organisation with paranoia[1]. Future research will help elucidate their relationship.

1.2.5 Summary

The existing research on non-clinical paranoia suggests that the experience of paranoid thoughts is not only common in non-clinical populations, but is also associated with significant psychological distress. Moreover, there is a strong evidence base suggesting that non-clinical paranoia is maintained by processes that are known to be amenable to psychological interventions, including a worry thinking style and self-related processes. The study of psychological interventions for non-clinical paranoia is therefore warranted not only as a proxy for clinical paranoia but also for individuals who are distressed by experiences of non-clinical paranoia. One psychological intervention with possible benefits for individuals with distressing paranoid beliefs is mindfulness (Chadwick, 2014; Chadwick, Hughes, Russell, Russell, & Dagnan, 2009; Ellett, 2013). The relevant literature is discussed in the following section.

[1] Medline, Embase, PsychInfo were searched through OvidSP from the beginnings of their collections to date. The search terms used were: (paranoi*) AND (self-knowledge). The search was limited to titles and abstracts. 39 articles were retrieved none of which explored the association of paranoia with self-knowledge as defined in Showers, 1992.

1.3 Mindfulness interventions for paranoia

1.3.1 Definition of Mindfulness

Mindfulness, which originates from Eastern Buddhist traditions, is commonly defined as "a practice of awareness that emerges through paying attention on purpose, in the present moment, non-judgementally to things as they are" (Kabat-Zinn, 1994, p. 4). Such awareness is achieved through the practice of meditation which is defined as "the intentional self-regulation of attention from moment to moment" (Baer, 2003, p. 125). Mindfulness has become more recently a core component of different western therapeutic approaches, such as Mindfulness-Based Stress Reduction (MBSR) (Kabat-Zinn, 1982), Mindfulness-Based Cognitive Therapy (MBCT) (Teasdale et al., 2000), but also Acceptance and Commitment Therapy (ACT) (Hayes, Strosahl, & Wilson, 1999), Dialectical Behaviour Therapy (DBT) (Linehan, 1993), and Compassion-Focused Therapy (CFT) (Gilbert, 2005). Mindfulness has been applied with a wide range of mental health problems over recent years and there is accumulating evidence suggesting that it is effective in the treatment of psychological distress including chronic fatigue, depression, and anxiety disorders (Baer, 2003; Hofmann, Sawyer, Witt, & Oh, 2010). More recently, mindfulness has also attracted attention as a potentially helpful intervention for the positive symptoms of psychosis, including paranoia.

1.3.2 Mindfulness interventions for psychosis

Chadwick and colleagues argue that therapy for psychosis should be aimed at alleviating the distress associated with paranoid thoughts, voices, or delusions instead of challenging the content of these experiences (Chadwick et al., 1996). This is partly because of accumulating

research evidence that traditional Cognitive Behavioural Therapy (CBT), which focuses on altering the content of delusional beliefs, has a small to moderate effect size in psychosis (Van der Gaag, Valmaggia, & Smit, 2014). The theoretical rationale for the relevance of mindfulness as a psychological intervention aimed at alleviating the distress associated with psychotic experiences is based on the idea that the distress associated with the positive symptoms of psychosis, including paranoid thoughts, results from the individual's lack of awareness and experiential avoidance of the experience, the negative judgement of the self and the experience, and rumination (Chadwick et al., 2005) (see also Figure 1). A mindful approach on the contrary is characterised by an awareness and acceptance of the experience as transitory and certainly not as a definitive or accurate representation of the self (Chadwick et al., 2005) (Figure 1). It is also characterised by a willingness to observe the experience allowing it in and out of awareness without ruminating over it, which reduces the psychological distress associated with the experience (Chadwick et al., 2005) (Figure 1). Likewise, Freeman and colleagues (2002) emphasise the importance of alleviating the emotional distress associated with persecutory delusions through coping strategies that permit distancing from the delusions without suppressing them. Mindfulness interventions are therefore highly relevant for the positive symptoms of psychosis due to their emphasis on changing the ways in which the individual relates to difficult thoughts and experiences rather on challenging their content.

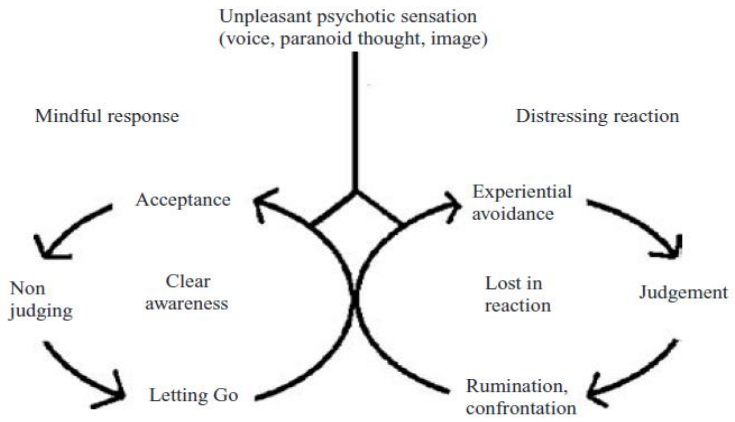

Figure 1: Rationale for the relevance of mindfulness for psychotic experiences (from Chadwick et al. 2005)

Chadwick (2014) describes the ways in which mindfulness interventions need to be adapted for individuals with a diagnosis of psychosis. Such adaptations include a maximum of 10 minutes of meditation practice, frequent guidance during the meditation (i.e. every 30 - 60 seconds), absence of long silences, and explicit references to the psychotic sensations in a normalising way (Chadwick, 2014). These adaptations are important as they help the individual not become lost in struggling with psychotic symptoms, such as hallucinations or paranoid thoughts, which they are likely to experience during the mindfulness meditation (Chadwick, 2014).

Research on the effectiveness of mindfulness interventions in psychosis is at early stages with a small number of studies having been published in the last decade. One of the first

studies of mindfulness for psychosis assessed the impact of group-based mindfulness training alongside usual psychiatric care for 11 individuals with subjectively distressing psychosis (Chadwick et al., 2005). The training was an adapted version of the Mindfulness-Based Cognitive Therapy (MBCT) and involved six weekly 90-minute sessions which included two 10-minute guided meditations, where participants were taught mindfulness of the breath followed by a short focus on the body. Participants were also encouraged to practise the meditations outside the sessions. The findings suggest that there was a significant improvement from pre- to post- treatment in clinical functioning as assessed by a self-report measure of wellbeing, symptoms, life functioning, and risk (Chadwick et al., 2005). A replication of the above study used a randomized treatment versus waitlist control design with 22 participants with psychosis or distressing voices to compare a mindfulness group to a waitlist control on measures of clinical functioning (Chadwick et al., 2009). The study found that the group differences on various indices of clinical functioning were not significant albeit they were in the expected direction. Moreover, the combined pre - post data analysis showed significant improvements in clinical functioning (Chadwick et al., 2009). Another Randomised Controlled Trial of Mindfulness-Based Cognitive Therapy for 18 individuals with psychosis with a waitlist control condition found that the intervention group scored significantly higher than the control group in their ability to respond mindfully to stressful internal events (Langer, Cangas, Salcedo, & Fuentes, 2012). More recently, a non-randomized, non-controlled prospective study assessed the effects of a mindfulness-based intervention that consisted of eight hourly sessions within 4 weeks for 16 individuals recovering from a first episode of psychosis (Van der Valk, Van de Waerdt, Meijer, Van den Hout, & de Haan, 2013). The authors

report that there were not any adverse effects on psychotic symptoms, and that there were significant improvements in psychological symptoms such as agoraphobic symptoms, and psycho-neuroticism (Van der Valk et al., 2013). However, strong conclusions cannot be drawn from this study due to its uncontrolled design. Lastly, a multi-site Randomised Controlled Trial assessing the effectiveness of a mindfulness psychoeducation intervention for Chinese outpatients with schizophrenia reported significant improvements of the intervention group on mental and psychosocial functioning, insight into illness, and re-hospitalization rates at the 18 months follow-up compared to the Treatment As Usual control condition which did not experience similar improvements (Chien & Lee, 2013).

A meta-analysis of 13 studies of mindfulness-based interventions for psychosis found a medium effect size on negative and positive symptoms both in pre - post analyses and in comparisons with a control group, suggesting that mindfulness interventions are indeed promising in psychosis (Khoury, Lecomte, Gaudiano, & Paquin, 2013). However, it should be noted that the meta-analysis included studies that assessed the effects of a diverse range of mindfulness-based interventions (e.g. ACT, CFT, MBCT) and varied considerably in terms of the extent to which they included formal meditation practice (Khoury et al., 2013). More recently, the first Randomised Controlled Trial of mindfulness for 108 individuals with distressing voices compared Group Person-Based Cognitive Therapy (PBCT) (an intervention combining cognitive therapy with mindfulness) with Treatment As Usual, against Treatment As Usual only (Chadwick et al., 2016). The authors report that the Person-Based Cognitive Therapy group experienced significant post-intervention improvements on measures of distress associated with voices, perceived controllability of voices, recovery, and also

depression, with the latter effect remaining significant at 6-month follow-up (Chadwick et al., 2016).

1.3.3 Mindfulness interventions for clinical paranoia

Out of the existing studies of mindfulness interventions in psychosis, there is a small number that have investigated the effects of mindfulness practice specifically on measures of paranoia. A Randomised Controlled Trial with 22 individuals with psychosis or distressing voices compared a mindfulness group to a waitlist control on measures of clinical functioning including on a measure of severity and intensity of paranoid delusional beliefs (PSYRATS) (Chadwick et al., 2009). Although the study did not find any significant group differences on severity and intensity of paranoid delusions, these were in the expected direction. Moreover, considering the study was underpowered for anything other than large effect sizes the findings cannot be considered conclusive (Chadwick et al., 2009).

More recently, a single case design study, whereby two individuals with distressing paranoid beliefs received training on mindfulness through six individual hourly sessions and encouragement of meditation practice outside sessions, found significant pre - post-intervention improvements on conviction, distress, impact, and preoccupation of paranoid beliefs (Ellett, 2013). The author reports in relation to distress associated with persecutory delusions a reduction from 10 at baseline to 1 at 1-month follow-up (on a 10-point scale) for individual A, and from 7 to 1 for individual B (Ellett, 2013). Other improvements included an increase in self-reported mindfulness of distressing paranoid beliefs, and reductions in anxiety, and depression (Ellett, 2013). All the improvements were maintained at 1-month

follow-up (Ellett, 2013). Lastly, a secondary analysis of a Randomised Controlled Trial of Mindfulness-Based Cognitive Therapy for 130 individuals with residual affective dysregulation after at least one episode of major depressive disorder found that paranoia, as measured by momentary self-report assessments of feeling suspicious, was significantly reduced in the intervention group as opposed to the control condition where a significant increase in paranoia was found (Collip et al., 2013).

The above preliminary studies suggest that mindfulness interventions appear to be helpful for individuals with experiences of clinical paranoia. However, considering the limitations of the existing studies further research is required with larger sample sizes, comparisons with active controls, and well-validated measures of paranoia and paranoia-related dimensions before conclusions can be drawn with confidence about the effectiveness of mindfulness interventions on clinical paranoia. More research is also needed on the effectiveness of mindfulness interventions for non-clinical paranoia in light of the frequency and distress of paranoia in non-clinical populations.

1.3.4 Mindfulness interventions for non-clinical paranoia

To the author's knowledge there is only one empirical study on the effects of mindfulness interventions on non-clinical paranoia (Shore, Strauss, Cavanagh, Hayword, & Ellett, in submission). The study employed a randomised controlled design with a convenience non-clinical sample of 110 participants, the majority of whom were students and females (Shore et al., in submission). Participants were randomly assigned to a mindfulness intervention condition or a waitlist control condition and they completed measures of trait paranoia and

mindfulness at baseline, post-intervention, and 1 week post-intervention (Shore et al., in submission). The intervention required participants to listen for 2 weeks on a daily basis to 10 minutes of a guided mindfulness meditation (Shore et al., in submission). The meditation was available through a webpage which also included an introduction to mindfulness and a section with information on how to incorporate mindfulness into everyday activities (Shore et al., in submission). The results suggest that there was a significant group by time interaction whereby the mindfulness condition experienced statistically significant reductions in trait paranoia of a medium effect size from baseline to post-intervention [d = 0.60, 95% CI for d = (0.11, 1.08)], and of a large effect size from baseline to 1-week follow-up [d = 0.80, 95% CI for d = (0.27, 1.30)] (Shore et al., in submission). On the contrary, there were not statistically significant changes in trait paranoia in the waitlist control condition from baseline to post-intervention or from baseline to 1-week follow-up (Shore et al., in submission).

This was the first study demonstrating that mindfulness is potentially an effective intervention for non-clinical paranoia (Shore et al., in submission). However, there are certain limitations that should be considered when interpreting the results of the study, such as the limited generalisability of the findings due to the opportunistic sample used which was also skewed on certain demographic characteristics (i.e. the majority of the participants were female and students). Moreover, the study used a waitlist control and therefore it cannot be assumed that mindfulness was indeed more effective than other active interventions. The study did not also examine the effects of mindfulness on psychological distress associated with the experience of paranoia or on processes that are implicated in the development and maintenance of non-clinical paranoia which, as discussed above, are key aspects of the

experience of paranoid thoughts. Another limitation is that the study did not specify any inclusion criteria for non-clinical paranoia, unlike other existing studies which recruited participants who scored high on measures of non-clinical paranoia (Combs, Finn, Wohlfahrt, Penn, & Basso, 2013; Combs, Michael, & Penn, 2006; Combs & Penn, 2004). This is important as it limits the extent to which the findings of Shore and colleagues can also be interpreted as an analogue for clinical paranoia. Lastly, Shore and colleagues did not include a long-term follow-up and therefore the effectiveness of mindfulness practice for non-clinical paranoia beyond the immediate period after the end of the intervention could not be determined. Some of the above limitations will be addressed in the current study.

1.3.5 Insight Meditation versus Loving Kindness Meditation

Mindfulness interventions may vary significantly as there are a few different types of mindfulness meditations that have been described in the literature all of which have origins in Eastern Buddhist traditions. One of the most common meditations of mindfulness interventions encourages the observation and acceptance of internal experiences in a non-judgemental way while maintaining a focus on breathing (Bishop et al., 2004; Feldman et al., 2010). In the most common version of this practice meditators are instructed to maintain their attention on their breathing, to notice whenever their mind wanders to thoughts and/or feelings, to let them go without judging them, and to return their attention to their breathing (Bishop et al., 2004). This type of meditation which is known in the literature as Insight Meditation (IM) has been used in the majority of the existing studies of mindfulness in psychosis, in clinical, and in non-clinical paranoia.

More recently, a different meditation practice, known as Loving Kindness Meditation (LKM), which focuses on increasing social connection and kindness for oneself and others, has also started being investigated in relation to its effects on mental health outcomes (Hofmann, Grossman, & Hinton, 2011; Shonin, Gordon, Compare, Zangeneh, & Griffiths, 2015). In the most typical version of Loving Kindness Meditation the meditator is instructed to direct warm feelings and kindness first towards the self, then towards others in a progressive fashion (i.e. towards a good friend, followed by a neutral person, followed by a person associated with difficult feelings), and eventually to the entire universe (Hofmann et al., 2011). In Loving Kindness Meditation, the focus of mindful awareness and attention is the imagined or actual experience of the emotional state when the meditator is attempting to generate loving kindness towards the self and others (Hofmann et al., 2011). Within Buddhist tradition and practice, Loving Kindness Meditation and other compassion-focused meditations are thought to be highly relevant for individuals who experience high levels of anger and hostility, as these practices help increase positive emotions, compassion and empathy (Hofmann et al., 2011). This is supported by preliminary studies which found that Loving Kindness Meditation interventions are associated with an increase in positive affect and a reduction in negative affect (Hofmann et al., 2011). It has therefore been proposed that Loving Kindness Meditation would be a promising psychological intervention for psychological difficulties that involve interpersonal processes, due to its emphasis on developing kindness towards oneself and others (Hofmann et al., 2011). Given that paranoia is defined as an interpersonal process which is concerned with the fear that others intend to cause harm to the individual (Ellett et

al., 2003; Freeman & Garety, 2000), Loving Kindness Meditation might be particularly relevant for both clinical and non-clinical paranoia.

To the author's knowledge there are two studies on the effects of Loving Kindness Meditation in individuals with psychosis or psychotic symptoms (Johnson et al., 2009, 2011). The first one presents three case studies of individuals diagnosed with schizophrenia spectrum disorders who participated in a six-weekly group programme which involved discussion, skills teaching and practice of Loving Kindness Meditation (Johnson et al., 2009). The authors report that all three participants described significant post-intervention improvements in their daily functioning such as in a-sociality, blunted affect, self-motivation, interpersonal relationships, and relaxation capacity (Johnson et al., 2009). The second study, which was an extension of the first, used an uncontrolled pre – post intervention design with 18 individuals with a diagnosis of schizophrenia spectrum disorders and increased negative symptoms (Johnson et al., 2011). The intervention also consisted of six weekly group sessions which included discussion, skills teaching, and practice of Loving Kindness Meditation (Johnson et al., 2011). Participants were also encouraged to practise Loving Kindness Meditation between sessions by listening to a CD with meditations similar to those practised in the group and also informally during the day or during distressing situations (Johnson et al., 2011). The practice of Loving Kindness Meditation developed over the weeks as it started with guided meditations instructing participants to contemplate a person or situation in which they already felt kindness, and progressively extending these feelings towards themselves and others as described above (Johnson et al., 2011). The study found that practice of Loving Kindness Meditation was associated with large pre - post and pre - 3-month

follow-up improvements both on negative symptoms and positive emotions, as well as on environmental mastery, self-acceptance, and satisfaction with life (Johnson et al., 2011). The findings of the study suggest that Loving Kindness Meditation is potentially a helpful psychological intervention for psychosis however due to its uncontrolled design it cannot be assumed with confidence that the improvements observed were due to the practice of Loving Kindness Meditation. Moreover, the study did not examine the impact of Loving Kindness Meditation on positive symptoms of psychosis such as on paranoid thoughts. These are two gaps in the literature that the current study will attempt to address.

1.3.6 Comparison of Insight Meditation to Loving Kindness Meditation

To the author's knowledge there are not any studies comparing the effects of Insight Meditation and Loving Kindness Meditation in psychosis, or in paranoia [2]. More broadly, there appear to exist a small number of comparative studies of Insight Meditation and Loving Kindness Meditation in relation to different psychological outcomes, all of which used non-clinical samples. Two of them did not find any significant differences between Loving Kindness Meditation and Insight Meditation on psychological outcomes. The first, a single subjects study of the effects of Loving Kindness Meditation and Insight Meditation on positive and negative affect and mindfulness with 31 novice meditators, found that (a) there were significant improvements on mindfulness, acceptance and positive affect after both meditations, (b) there were not any significant differences between Loving Kindness

[2] Medline, Embase, PsychInfo were searched through OvidSP from the beginnings of their collections to date. The search terms used were: (mindfulness or meditation) AND (paranoi*). The search was limited to titles and abstracts. 48 articles were retrieved none of which compared different types of mindfulness meditations for paranoia.

Meditation and Insight Meditation, but (c) the effects of Loving Kindness Meditation on positive affect had longer duration (May, Weyker, Spengel, Finkler, & Hendrix, 2012). The second study used a 4 (groups) by 2 (pre – post intervention) non-randomized controlled design study to compare the effects of Loving Kindness Meditation, Insight Meditation, combined Insight Meditation and Loving Kindness Meditation, and a control condition on measures of anxiety, positive and negative affect, irrational beliefs, coping strategies, and hope (Sears & Kraus, 2009). The authors report that there was not a significant main effect of group or time, however there were significant pre - post improvements in the combined Loving Kindness Meditation and Insight Meditation condition in anxiety, negative affect, and hope (Sears & Kraus, 2009). It should be however noted that the various conditions differed substantially in terms of the duration of the intervention which could explain the lack of significant differences between the conditions (i.e. the combined Insight Meditation and Loving Kindness Meditation condition was delivered over 1 week as opposed to the Loving Kindness Meditation and Insight Meditation only conditions which were a lot briefer) (Sears & Kraus, 2009). Moreover, both studies were underpowered for anything but large effect sizes. The above limitations preclude any conclusions about the lack of a differential impact of Loving Kindness Meditation and Insight Meditation on psychological outcomes.

The other two existing comparative studies of Loving Kindness Meditation and Insight Meditation suggest that there are some distinct effects between the two meditations. Feldman and colleagues (2010) compared the effects of a single session of 15 minutes of Insight Meditation, Loving Kindness Meditation, and progressive relaxation with 190 novice female meditators and found that decentering reduced after all three conditions albeit the

effects were higher for the Insight Meditation. The second study was a randomised comparative study on the effects of a single 15-minutes session of Insight Meditation and Loving Kindness Meditation on decentering, positive affect toward self and others, and self and other referential processing (Logie & Frewen, 2015). The authors report that participants who practised Loving Kindness Meditation or Insight Meditation experienced significantly higher levels of decentering and positive affect towards their self and others than those in the control condition. More importantly, individuals who practised Loving Kindness Meditation showed significantly lower levels of self-positivity bias compared to those randomised in the Insight Meditation or the control condition (Logie & Frewen, 2015). Self-positivity bias is the tendency to view oneself more positively than others (Logie & Frewen, 2015). The authors suggest that this is possibly a reflection of the explicit focus of Loving Kindness Meditation on increasing positive emotions and kindness towards the self and others which might lead to "relative rebalancing or equalization of positive associations referring to self versus others" (Logie & Frewen, 2015, p. 785). The latter is also of potential relevance for the impact of Loving Kindness Meditation on measures of paranoia. Given that paranoia is concerned with fears and negative beliefs about others as dangerous (Freeman, 2007), it would not be unreasonable to expect that Loving Kindness Meditation will be highly effective on measures of paranoia due to its explicit focus on social connectivity and kindness towards others.

To summarise, the existing limited research on the differential impact of Insight Meditation and Loving Kindness Meditation on psychological outcomes is not conclusive. Methodological limitations such as small sample sizes and lack of uniformity in the way the

interventions were delivered preclude any assumptions about the differential effects of Insight Meditation and Loving Kindness Meditation. As a general observation, it appears that there are significant improvements on psychological wellbeing after both types of meditation, albeit there are also preliminary indications that Loving Kindness Meditation and Insight Meditation might differ in terms of the duration and the size of their effects on different psychological outcomes. With regard to their differential impact on measures of paranoia, it is expected that both Loving Kindness Meditation and Insight Meditation will have a positive impact on measures of paranoia as Insight Meditation has already been shown to be an effective intervention for clinical and non-clinical paranoia (Chadwick et al., 2009, 2005; Ellett, 2013; Shore et al., in submission), whilst there is also preliminary evidence that Loving Kindness Meditation appears to be promising in the area of psychosis (Johnson et al., 2009). Moreover, the interpersonal focus of Loving Kindness Meditation (i.e. generating kindness towards others) is of particular relevance in the area of paranoia as paranoia is concerned with perceptions about others and their intentions to cause harm to the individual (Freeman, Garety, & Kuipers, 2001).

1.4 Paranoia-related processes and mindfulness

To the author's knowledge there is a lack of research on the impact of mindfulness interventions on processes associated with paranoia and paranoia distress. As discussed above, a worry thinking style and self-related processes are two factors which are implicated in the development and maintenance of paranoia and paranoia distress and this is supported by a substantial amount of research evidence (Freeman et al., 2008; Freeman & Garety, 2014, 1999; Martinelli et al., 2013; Simpson, MacGregor, Cavanagh, & Dudley, 2012; Tiernan et al.,

2014). A worry thinking style and self-related processes are also processes that mindfulness interventions have been found to have a positive impact on. The relevant literature is discussed below.

1.4.1 A worry thinking style

An increased awareness and disengagement from repetitive forms of thinking, is one of the theoretically implicated mechanisms of change of mindfulness interventions for depression relapse (Segal, Williams, & Teasdale, 2012). Through mindfulness that uses Insight Meditation the individual starts to disengage from ruminative thinking by learning to observe and approach thoughts as only thoughts which are transient and passing phenomena rather than an accurate reflection of the self or one's reality (Teasdale, Segal, & Williams, 1995).

The above theorem is corroborated by empirical research which suggests that there is a significant relationship between high levels of mindfulness and low levels of repetitive thinking. Chambers, Lo, and Allen (2007) found that intensive mindfulness training using Insight Meditation with 20 novice meditators resulted in reduced rumination. Evans and Segerstrom (2010) also found that two mindfulness components, attention regulation and non-judgemental attitude towards one's experience, correlated with less repetitive thinking in a non-clinical sample of 200 undergraduate students who practised Insight Meditation. A recent meta-analysis on the mechanisms of change of mindfulness-based interventions confirmed that worry and rumination are significant mediators of the impact of mindfulness interventions on mental health outcomes such as anxiety, depression, psychopathological symptoms, stress and negative affect (Gu, Strauss, Bond, & Cavanagh, 2015).

To the author's knowledge there is not any published research on the effects of Loving Kindness Meditation on repetitive forms of thinking such as worry and rumination. However, a recent study comparing the effects of an Insight Meditation (i.e. mindful breathing) to a Loving Kindness Meditation and progressive relaxation with 190 novice female meditators immediately after practising 15 minutes of each, found that decentering (i.e. the ability to view thoughts as thoughts rather than as objective reflections of one's life) reduced after all three conditions albeit the effects were higher for the Insight Meditation (Feldman et al., 2010). Given that decentering has been proposed to be one of the processes that explain the impact of mindfulness interventions on repetitive forms of thinking such as rumination (Baer, 2003), the above study findings suggest that although both Insight Meditation and Loving Kindness Meditation are likely to reduce worry and rumination the effects of Insight Meditation on worry and rumination are expected to be more prominent compared to those of Loving Kindness Meditation. Of course, the findings of this study should be interpreted with caution as the exact relationship of decentering with worry and rumination remains to be established (Feldman et al., 2010). Moreover, the intervention consisted of a single only 15-minutes session, and the outcomes were measured immediately after the intervention with no further follow-ups.

To sum up, it is expected that both Insight Meditation and Loving Kindness Meditation will reduce worry and rumination, but research is more conclusive about the effects of Insight Meditation on repetitive forms of thinking hence Insight Meditation is expected to be more effective than Loving Kindness Meditation on measures of worry and rumination.

1.4.2 Self-related processes

There has been emerging data suggesting that mindfulness interventions have a positive impact on self-related processes. For instance, Hölzel and colleagues present early self-report data which suggest that practice of Insight Meditation leads to a more positive self-representation, higher self-esteem, and higher acceptance of oneself, and also neuroimaging studies which have found that the practice of Insight Meditation impacts on brain structures and brain activities that are associated with self-referential processing (Hölzel et al., 2011). The authors discuss the shift in the perspective of the self as one of the processes of change of mindfulness interventions arguing that it is the non-judgemental observation of internal experiences that facilitates a detachment from the contents of consciousness including perceptions and judgments about the self (Hölzel et al., 2011). The impact of mindfulness interventions on the perspective of self is also supported by more recent studies. For instance, a cross-sectional questionnaire study found significant positive correlations between mindfulness and self-acceptance (Thompson & Waltz, 2008), whilst a recent Randomised Controlled Trial on the effects of Mindfulness-Based Cognitive Therapy on depression suggested that self-compassion was a significant mediator of the treatment effects (Kuyken et al., 2010). More recently, an experimental study demonstrated that a brief mindfulness induction resulted in significant increases in state self-esteem (Pepping, O'Donovan, & Davis, 2013). The above data suggest that mindfulness interventions that use Insight Meditations encourage a more accepting attitude towards the self through their emphasis on the non-judgemental observation and acceptance of internal experiences such as self-critical thoughts.

Loving Kindness Meditation on the other hand is a meditation practice that places direct emphasis on developing kindness and compassion not only towards others but also towards oneself (Hofmann et al., 2011), and is therefore by definition expected to foster a kinder attitude towards the self. The positive effects of Loving Kindness Meditation on self-related processes is also supported by empirical data. A recent Randomised Controlled Trial of Loving Kindness Meditation for individuals who scored high on self-criticism, found that participants who practised Loving Kindness Meditation showed significant reductions in self-criticism and significant increases in self-compassion when compared to the waitlist control condition immediately after the intervention whilst the effects were maintained at the 3-month follow-up (Shahar et al., 2015). Moreover, a within-subjects pre - post design study of Loving Kindness Meditation with 18 individuals with psychosis found that practice of Loving Kindness Meditation was associated with significant post-intervention improvements on measures of self-acceptance whilst the effect sizes were large post-intervention and medium at the 3-month follow-up (Johnson et al., 2011).

To the author's knowledge there is not any published research on the comparative effects of Loving Kindness Meditation and Insight Meditation on self-related constructs. Based on the literature and conceptual arguments presented above it is expected that both Loving Kindness Meditation and Insight Meditation will impact on the perspective of self by fostering a more compassionate and accepting attitude towards the self which is also expected to result in a more integrative self-knowledge organisation. Loving Kindness Meditation is expected to achieve this through nurturing self-kindness and self-compassion whilst Insight Meditation through decentering (i.e. non-judgemental observation and detachment from self-critical

thoughts and judgements). Due to the lack of comparative research on the effects of Loving Kindness Meditation and Insight Meditation on self-related processes, directional hypotheses about their differential impact on self-related processes, and on self-knowledge organisation in particular, cannot be determined at this point.

1.5 Gaps in the literature

An important gap that the current study aims to address is the lack of research on the effects of mindfulness interventions on paranoia in non-clinical populations despite the high prevalence and distress associated with non-clinical paranoia. As discussed above, to the author's knowledge there is only one empirical study of mindfulness interventions in non-clinical paranoia which found that practice of Insight Meditation reduced non-clinical paranoia when compared to a waitlist control condition (Shore et al., in submission). The present study aims to build on the findings of Shore and colleagues (in submission) by investigating the differential effects of Insight Meditation and Loving Kindness Meditation on paranoia and paranoia-related processes. This is also the first study to the author's knowledge that aims to investigate the effects of Loving Kindness Meditation on clinical or non-clinical paranoia. It also aims to address some of the methodological limitations of Shore and colleagues (in submission). In particular, the current study: (a) includes a 1-month follow-up in order to assess the longer term effects of the two meditations on non-clinical paranoia, (b) it assesses the effects of the two mindfulness meditations on paranoia distress, which is a key dimension of the experience of paranoid thoughts, and also on momentary experiences of paranoia (state paranoia), (c) it assesses the effects of the two mindfulness meditations on psychological processes that are implicated in the onset and maintenance of paranoia (i.e. a

worry thinking style which encompasses worry, rumination, and repetitive negative thinking) and on a psychological process that has yet to be investigated in relation to paranoia but is proposed to be relevant, that is self-knowledge organisation, and lastly (d) it uses a sample of participants who scored high on baseline measures of non-clinical paranoia as these are more likely to benefit from a psychological intervention. The latter could also potentially increase the generalisibility of the findings to clinical paranoia.

Another gap that the current study aims to address is the lack of published research on the comparative effects of different types of mindfulness meditations on paranoia in clinical or non-clinical populations. This is important because investigating the comparative effects of different mindfulness meditations could help elucidate the active components of mindfulness interventions for psychosis (Khoury et al., 2013). A comparative study of Loving Kindness Meditation and Insight Meditation on paranoia, paranoia distress, and associated processes such as worry, rumination and self-related processes will therefore advance our understanding of which mindfulness components might be more effective in improving paranoia-related outcomes.

1.6 Present study

The present study aims to address the above gaps in the literature by comparing the effects of Insight Meditation and Loving Kindness Meditation on the frequency of paranoid thoughts, on the associated distress, and on state paranoia, in a non-clinical sample. The study adopts a nomothetic approach in the measurement of paranoia, in that it uses existing, well-validated, general measures of paranoia as opposed to looking at participants' subjective

experiences of paranoia (which is the approach adopted by another trainee that this study was carried out in collaboration with). The present study will also assess the differential impact of Insight Meditation and Loving Kindness Meditation on psychological processes that have been discussed above as processes that are implicated in the development and maintenance of clinical and non-clinical paranoia (i.e. worry, rumination, repetitive negative thinking), and also on self-knowledge organisation which is a variable that has not yet been researched in relation to paranoia albeit it is proposed to be of relevance. Based on the literature discussed in this chapter the following hypotheses will be tested:

1. *Both Insight Meditation and Loving Kindness Meditation will reduce non-clinical paranoia and paranoia distress*
2. B*oth Insight Meditation and Loving Kindness Meditation will reduce rumination, worry, and repetitive negative thinking but Insight Meditation is expected to be more effective than Loving Kindness Meditation on measures of worry, rumination and repetitive negative thinking*
3. *Both Insight Meditation and Loving Kindness Meditation will reduce self-knowledge compartmentalisation*

2 Methods

2.1 Overview

This chapter presents the methods that were used for the investigation of the research aims and hypotheses that the current study set out to address. It starts with a description of the study design, followed by a section on the study sample, including information about the power analysis based on which the sample size was determined, the participant inclusion criteria, and the participant recruitment strategy. A section follows which presents the study variables that were measured during the two study phases and the scales that were used for their measurement, followed by brief sections describing the piloting process and the study procedures. The chapter closes with a description of the study interventions (i.e. Loving Kindness Meditation and Insight Meditation) and a section summarising the research ethics issues that were of relevance to the current study.

2.2 Design

The study used a randomised comparison design. Participants were randomly allocated to practise one of two mindfulness meditations: Insight Meditation or Loving Kindness Meditation. The dependent variables were: paranoia frequency, paranoia distress, state paranoia, rumination, worry, repetitive negative thinking, and self-knowledge compartmentalisation. The dependent variables were measured at three time-points (i.e. before the intervention, immediately post-intervention, and at 1-month follow up).

This study was part of a larger research study on the comparative impact of Insight Meditation and Loving Kindness Meditation on different measures of non-clinical paranoia

and associated processes which was conducted in collaboration with another trainee clinical psychologist. Only the procedures and measures that are relevant to the aims of this thesis are presented below.

2.3 Sample

2.3.1 Inclusion Criteria

The study used a convenience sample consisting of adults above 18 years of age who lived in the UK and who scored above pre-defined thresholds on validated measures of non-clinical paranoia. Participants were eligible for taking part in the study if they scored: (a) on or above the normative mean score on the Paranoia Scale as reported in the original validation study of the scale (i.e. above 42) (Fenigstein & Vanable, 1992) or (b) 'moderately distressing' in relation to at least two of the items on the Paranoia Checklist Distress scale (Freeman et al., 2005). There were no other inclusion or exclusion criteria.

The total sample of the study (prior to randomisation to the two meditations) comprised of 100 participants with a mean age of 28 years (SD=8.68). The majority were female (83%) and British (69%). 54% of the participants were employed whereas 41% were students. More details on the socio-demographic composition of the total final sample and of each of the two conditions are presented in the Results.

2.3.2 Power analysis

For the purposes of the power analysis, the effect sizes of studies of relevance to the present study were examined. Shore and colleagues' (in submission) Randomised Controlled Trial of Insight Meditation for non-clinical paranoia was the most relevant study as it is the first and

only existing study on the effects of a mindfulness meditation for non-clinical paranoia. The effect sizes reported by Shore and colleagues (in submission) for the within-subjects analyses for the mindfulness condition were medium (d = 0.62) for the pre - post-intervention comparisons, and large (d = 0.80) for the pre - 1-week follow-up. Moreover, the effect sizes reported for the between-groups analyses (mindfulness versus waitlist control) were medium/large post-intervention (d = 0.74) and medium at the 1-week follow-up (d = 0.60), based on Cohen's recommendations for effect sizes (Cohen, 1992). However, a smaller effect size was expected in the current study for the between-groups comparisons as the current study compares two active interventions both of which are mindfulness meditations. A medium effect size of d = 0.50 was therefore chosen for the power analysis (Cohen, 1992).

G-Power was used for the sample size calculation. With alpha at 0.05, statistical power at 0.80, and a medium effect size of d = 0.50 (Cohen, 1992), a total sample of 86 participants were required for a 3 (time: baseline, post-intervention, 1-month follow-up) x 2 (mindfulness conditions: Insight Meditation or Loving Kindness Meditation) mixed design ANOVA. A previous longitudinal questionnaire study of non-clinical paranoia with a 2-week period of participation reported a 3% attrition rate (Mattias, 2015). However, Shore and colleagues (in submission) reported a drop-out rate of 28% in their Randomised Controlled Trial of an online mindfulness intervention for non-clinical paranoia. In light of the above drop-out rates it was decided that 100 participants would be recruited to allow for a drop-out rate of 14%.

2.3.3 Recruitment

Two strategies were pursued for the recruitment of participants to the study. The first strategy was through the Royal Holloway University of London (RHUL) community of students

and members of staff. The study was advertised on the paid pool system of RHUL, which is a pool of students and members of staff who are interested in taking part in research studies that offer financial incentives. The study was also advertised on the RHUL digital noticeboard whereby adverts were posted monthly and through posters that were displayed at various locations around the RHUL campus (Appendix 1). The second recruitment strategy was through social media (i.e. Facebook, Twitter, Call for Participants) and snowballing (see Appendix 2). A study page was designed on each type of social media, that was not associated with the researchers' personal social media accounts. The study was also advertised on the social media profile pages of credible organisations such as the British Psychological Society and it was shared with the researchers' personal contacts who were encouraged to share the study details with their networks. We also asked the participants of the study to share it with their own networks.

2.4 Variables and Measures

2.4.1 Phase 1 Variables - Screening

On the screening survey, participants were asked to report their age, gender, ethnicity, employment status, their course details if they were students, details of their previous knowledge and experience of mindfulness, and if they ever had a diagnosis of mental health problems. They were also asked to complete the screening measures of trait paranoia (i.e. Paranoia Scale; Fenigstein & Vanable, 1992) and paranoia distress (i.e. the distress subscale of the Paranoia Checklist; Freeman et al., 2005). Participants were eligible to progress to phase 2 if they scored above the normative mean score of the Paranoia Scale (i.e. above 42)

or if they scored 'moderately distressing' on at least 2 items of the Paranoia Checklist distress subscale.

2.4.2 Phase 2 Variables - Intervention

Eligible participants who participated in the second phase completed measures of the following variables pre-intervention, post-intervention, and at the 1-month follow-up: paranoia frequency, paranoia distress, state paranoia, rumination, worry, repetitive negative thinking, and self-knowledge compartmentalisation. Pre-intervention participants also completed measures of depression and anxiety which were included in the study as possible covariate variables (i.e. if participants of the two meditation conditions had significantly different levels of baseline depression or anxiety, these variables would be controlled for in the main analysis due to their potential confounding effects on the study outcomes).

2.4.3 Measures

The details of the measures that were used in both phases of the study are presented below (see also Appendix 3).

Paranoia Scale (PS; Feningstein & Vanable, 1992)

The PS was used for the measurement of trait paranoia which was one of the screening criteria at phase 1. The PS is a 20-item scale of non-clinical trait paranoia that has been used extensively in studies of paranoia with students (Combs et al., 2013, 2006; Ellett & Chadwick, 2007; Fenigstein & Vanable, 1992). It includes items measuring beliefs about other people or external sources trying to influence one's behaviour or thinking, conspiracy beliefs, the belief of being spied on or talked about behind one's back, and general mistrust. Each item is rated

on a 5-point Likert scale (1 = not at all applicable to me, 5 = extremely applicable to me; range 20 - 100). Higher scores on the PS indicate higher levels of trait paranoia. PS was reported in the original validation study to have good internal reliability (α = .84), good test - retest reliability (*r* = .70) and good construct validity as suggested by its significant correlations with measures of trust (*r* = -.30), anger (*r* = .45), and control beliefs (*r* = .34) (Fenigstein & Vanable, 1992). Cronbach's alpha in the current sample was .91 which indicates excellent internal reliability.

Paranoia and Depression Scale (PDS; Bodner & Mikulincer, 1998)

The PDS is a measure of state paranoia and state depression. In the current study the paranoid cognitions subscale of the PDS was used to measure state paranoia. This is a 7-item scale including items capturing paranoid-like cognitions which were based on validated measures of paranoid psychopathology. The PDS asks participants to rate how much they experience each cognition right now on a 6-point scale (1 = not at all, 6 = very often; range 6 - 42). Higher scores on the PDS indicate higher levels of state paranoia. The PDS was reported in the original validation study to have adequate internal reliability (α = .79), and adequate convergent validity as indicated by its significant correlations with the SCS-90 paranoia scale (*r* = .67) (Bodner & Mikulincer, 1998). Cronbach's alpha in the current sample was .87 which indicates high internal reliability.

Paranoia Checklist (Freeman et al., 2005)

The Paranoia Checklist is a measure of three dimensions of paranoia: frequency, distress and preoccupation. The frequency and the distress subscales of the Paranoia Checklist were used

to measure the frequency of paranoid beliefs and the associated distress. Both subscales consist of the same 18 items which capture a range of paranoid beliefs which are "of a more clinical nature than those assessed in the Paranoia Scale" (Freeman et al., 2005, p. 428). Participants are asked to rate on 5-point Likert scales how frequently they experience each of the beliefs (0 = rarely, 4 = several times a week; range 0 - 72) and how distressing they find each belief (0 = not at all distressing, 4 = very distressing; range 0 - 72). Higher scores indicate higher levels of paranoia frequency and paranoia distress. The Paranoia Checklist has been validated in a non-clinical population and has been found to have high internal reliability (Cronbach's alpha above .90 for the total scale and for each of the three subscales), and adequate convergent validity as indicated by its highly significant correlations with the Paranoia Scale ((*r* = .71 for the frequency subscale, *r* = .58 for the distress subscale) (Freeman et al., 2005). Cronbach's alpha in the current sample was .91 for the distress subscale and .88 for the frequency subscale which indicate very high internal reliability for both subscales.

DASS-21(Lovibond & Lovibond, 1995)

DASS-21 is a measure of depression, anxiety and stress. The depression and anxiety subscales of DASS-21 were used for the measurement of anxiety and depression, which were measured as potential baseline covariate variables as explained above. Each scale consists of 7 items which capture symptoms of anxiety and depression respectively. Participants are asked to rate on a 4-point Likert scale how much the statement applied to them over the past week (0 = did not apply to me at all, 3 = Applied to me very much, or most of the time; range 0 - 21). Higher scores indicate higher levels of anxiety or depression. DASS-21 has been validated in a non-clinical population and has been found to have high internal reliability (α = .94 for

depression and α = .87 for anxiety), and good concurrent validity as indicated by the significant correlations of the depression subscale with the Beck Depression Inventory (*r* = .70), and of the anxiety subscale with the Beck Anxiety Inventory (*r* = .81) (Lovibond & Lovibond, 1995). Cronbach's alpha in the current sample was .82 for the anxiety subscale and .87 for the depression subscale which indicate high internal reliability for both subscales.

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991)

The RRS is a 22-item scale that measures three aspects of rumination: rumination on depressive symptoms, reflective pondering, and brooding. Participants are asked to rate each item on a 4-point Likert scale (1 = almost never, to 4 = almost always) (range 22 - 88). Higher scores on the total scale indicate higher levels of rumination. The RRS is reported to have high internal reliability (α = .89), high test - retest reliability (*r* = .80) and adequate construct validity as indicated by its significant correlation with the use of ruminative responses to depressed mood in a 30-day diary study (*r* = .62) (Nolen-Hoeksema & Morrow, 1991). Cronbach's alpha in the current sample was .92 which indicates excellent internal reliability.

The Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011)

The PTQ is a trans-diagnostic measure of repetitive negative thinking that captures three characteristics of repetitive negative thinking: repetitiveness, intrusiveness and difficulties to disengage. It consists of 15 items rated on 5-point frequency scale (0 = never to 4 = almost always; range= 0 - 60). Higher scores indicate higher levels of repetitive negative thinking. The PTQ was reported to have high internal reliability (α = .95) and good re - test reliability (*r* = .69) in two studies with non-clinical and clinical participants (total *N* = 1832). The validity of

PTQ was supported by significant high correlations with other measures of repetitive negative thinking and symptoms and clinical diagnoses of depression and anxiety (Ehring et al., 2011). More recently, its psychometric properties were also studied in a group of patients with psychosis. The results were suggestive of high internal reliability in this population (α = .97). Cronbach's alpha in the current sample was .95 which indicates excellent internal reliability.

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990).

The PSWQ is a 16-item scale measuring the tendency, intensity and uncontrollability of trait worry. Items are rated on a 5-point Likert scale (1 = not at all typical, 5 = very typical; range 16 - 80). Higher scores indicate higher levels of worry. The PSWQ has been validated extensively and has been shown to have high internal reliablity in clinical and non-clinical samples, with Cronbach's alpha reported between .88 and .93 and high test - retest reliability (*r* = .93) (Meyer, Miller, Metzger, & Borkovec, 1990; Van Rijsoort, Emmelkamp, & Vervaeke, 1999). It is also reported to have good concurrent validity (students who met all the criteria of Generalised Anxiety Disorder scored significantly higher on the PSWQ than those who did not meet any or met some criteria) (Meyer, Miller, Metzger, & Borkovec, 1990). Cronbach's alpha in the current sample was .72 which indicates acceptable internal reliability.

Self-knowledge compartmentalisation (Showers, 1992)

Self-knowledge compartmentalisation is measured via a task which involves sorting 40 cards, 21 of which contain positive characteristics (e.g. curious, motivated) and 19 of which contain negative characteristics (e.g. tense, insecure), into categories which represent different aspects of one's self or one's life. Participants are asked to think of different aspects of

themselves or their lives that are meaningful to them and to give a label to each of these aspects (e.g. student, taking tests, work, mother). Then they are asked to look at the list of the 40 characteristics and to sort the characteristics into the categories which they identified as meaningful aspects of themselves or their lives. Participants can use for each category as many characteristics from the list as they want. Characteristics can be repeated across different categories. A perfectly compartmentalised organisation of self-knowledge is characterised by categories which include either solely negative or solely positive characteristics (e.g. in relation to self as student the participant chooses 'curious', 'motivated', and 'interested', whilst under taking tests he/she chooses 'tense', 'distracted', 'insecure'). The measure of compartmentalisation across the self-aspects is the phi coefficient (or Cramer's V) which is based on a chi-square statistic computed for each participant's sort (Showers, 1992). Phi ranges from 0 to 1, where 0 represents a perfectly random sort containing a mixture of positive and negative attributes and 1 indicates perfectly compartmentalised self-knowledge containing solely negative or solely positive attributes.

2.5 Piloting

The study procedures and the measures were piloted with 6 members of the public. Pilot participants were consulted in terms of the study procedures (e.g. clarity of measures, experience of using the online survey platform, participation fatigue, how to optimise recruitment and minimise attrition), the clarity and readability of the different study forms (i.e. information sheet, consent form, debrief form), the format of the meditation files (e.g. CDs or mp3 electronic files), and the content and format of the adverts that were used on social media. Feedback collected during the piloting was considered for the improvement of

different procedures and study materials. For example, a consistent theme during the piloting was that the instructions of the self-knowledge compartmentalisation task were not very clear especially in relation to what the aspects of one's self or life should represent. In response to this feedback it was decided that the researchers would spend some time with the participants prior to the completion of the self-knowledge task in order to clarify the participants' questions. Another change that was implemented in response to feedback from the piloting was the decision to email participants half way through the intervention (i.e. 1 week after the start of the meditation practice) to ask if they had any questions and to remind them to complete the questionnaires post-intervention.

2.6 Procedure

2.6.1 Phase 1 - Screening

Those who were interested in the study were directed to an online page that hosted the screening survey. Participants were first asked to read the study information sheet and to sign a consent form (Appendices 4 & 5). On the information sheet participants were told that the aims of the study were to investigate the comparative effects of two mindfulness meditations on mental wellbeing without an explicit reference to paranoia. The reason for this was to ensure that participants would not alter their responses and it is a practice that has been used in previous research on non-clinical paranoia (Mattias, 2015). After providing informed consent, participants were asked to complete the screening survey which included the demographic questions, the Paranoia Scale (Fenigstein & Vanable, 1992), and the Frequency and Distress subscales of the Paranoia Checklist (Freeman et al., 2005). The

screening survey lasted approximately 10 minutes. The participants who scored above the specified thresholds, and therefore met the inclusion criteria, were invited via email to take part in the main phase of the study. Participants who completed the screening survey were entered in a prize draw for Amazon vouchers worth a total of £50.

2.6.2 Phase 2 - Intervention

Eligible participants who agreed to continue in the second phase were contacted to arrange a call with one of the researchers over Skype. During the Skype call the researchers answered any outstanding questions and presented the link to the online baseline questionnaire. Following the completion of the measures participants were sent the audio file that contained the meditation that they were allocated to practise for 14 consecutive days. They were also emailed a diary where they were requested to write if they listened to the meditation on each of the 14 days. Participants completed the measures again at the end of the 14-day intervention and 1 month after the end of the intervention and returned their practice diaries. Completion of the baseline, post-intervention, and 1-month follow-up questionnaires lasted approximately 45 minutes. After completing their participation in the study, participants were emailed a debrief form which revealed the aims of the study (Appendix 6) and were also entered in a second prize draw for Amazon vouchers worth a total of £50. All the surveys were administered on Qualtrics, an online survey platform (Qualtrics, 2016). In order to preserve anonymity every participant was given an ID number which they used throughout the study. Participants who did not complete the post-intervention or the 1-month follow-up questionnaires on the requested dates were followed-up with up to two reminder emails. If

they did not complete the questionnaires following the two reminders they were registered as drop-outs.

2.6.3 Randomisation

Eligible participants who agreed to take part in the second phase were randomly allocated to practise either Insight Meditation or Loving Kindness Meditation. The randomisation plan was generated in 5 blocks of 20 using online software *www.randomization.com*. Both the participants and the researchers were blind to the interventions, as the meditation files were named by an independent person as meditation A and meditation B, and the researchers were only un-blinded when all data had been collected.

2.7 Mindfulness Conditions

The intervention consisted of daily mindfulness practice by listening to a 10-minute Insight Meditation or a 10-minute Loving Kindness Meditation once per day for 14 consecutive days in line with Shore and colleagues' study (in submission). The meditation files were matched in terms of duration (10 minutes) and format of delivery (mp3 files that were recorded with the same female voice), whilst they differed in content. The Insight Meditation was the same as the meditation that was used by Shore and colleagues (in submission) which is based on Chadwick's Person-Based Cognitive Therapy for Psychosis (Chadwick, 2006). The Insight Meditation starts by grounding awareness in body and breathing. Gradually, participants are guided to bring their full awareness to internal experiences and sensations (e.g. thoughts, feelings, sounds) and to let them come and go without reacting by re-focusing their attention on their breathing. The Loving Kindness Meditation was based on a meditation script available

on the University of California Los Angeles (UCLA) Mindful Awareness Research Centre (http://marc.ucla.edu/mindful-meditations). During the Loving Kindness Meditation participants were guided to imagine directing and receiving warm feelings and kindness first towards and from someone that when they think of they feel happy (i.e. it could be an animal or a person), then towards the self, and later towards others (i.e. towards people they know or do not know, people they love, or people they have difficulties with, and eventually to everyone).

Participants were told that they could listen to the meditation at any time and place of their choosing during the day. In order to monitor their adherence to the intervention participants were asked to keep a diary of their practice which they submitted once they completed the 2 weeks of the meditation practice (Appendix 7). Participants also received a reminder email half-way through the intervention and were advised to set up their own reminders on a more frequent basis.

2.8 Ethics

The study received ethical approval from the RHUL Psychology Ethics Department (Research Ethics Committee Project ID: 99 / see also Appendix 8). Participants gave informed consent before signing up to the study (see study procedures) and were informed that they were free to withdraw from the study at any point without any repercussions. No other major ethical issues were anticipated as the participants were volunteers from a non-clinical population, their data were kept confidential throughout the study and were anonymised at the end of their participation in the study. However, there was a small possibility that eligible

participants could have experienced distress after having being informed that they were selected based on their high scores on the paranoia measures. To minimise potential distress, all participants were debriefed after they completed the study about the frequent occurrence of paranoid beliefs in non-clinical populations and about the low thresholds used in the study. They were also informed about the fact that the measures used in the study were not diagnostic of mental health problems. Moreover, participants were advised on the information sheet to stop the study should they experience distress, and were directed to support services such as their GP, and mental health charity MIND. Participants were also given the contact details of the researchers in case they had any questions before and during their participation in the study. No participant contacted the researchers during the study to indicate that they experienced distress because of their participation in the study.

3 Results

3.1 Overview

This chapter presents the results of the data screening and statistical analyses. It starts with a section on data cleaning processes that were used prior to the main analyses. These include exploratory data analyses such as descriptive statistics for all the variables used, assessment of continuous variables for normality of distribution and homogeneity of variance, data transformations for variables with non-normal distributions, assessment of and management of outliers, and handling of missing data. The second section of the chapter presents the demographic characteristics and baseline covariate variables for the final total sample and for each of the two meditation conditions (Loving Kindness Meditation versus Insight Meditation), as well as the comparison statistics that were used to compare the two conditions on the demographic and baseline covariate variables. A section follows presenting data on the demographic and baseline comparisons between study completers (i.e. those who completed the post-intervention and follow-up measures) versus those who dropped out of the study. The chapter finishes with a section reporting the main statistical analyses that were undertaken to address the study hypotheses. All statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS), version 21 (IBM Corp., 2012).

3.2 Data checking and cleaning

The process of data cleaning involved a series of exploratory data analyses. These included producing the descriptive statistics for all the variables at all time-points, both for the total

sample but also for each of the two meditation conditions separately. The descriptive statistics included frequencies and percentages for categorical variables, and the mean, standard deviation, range, skewness, and kurtosis for continuous variables. This was to check the data to ensure that all variables were within the expected ranges of their respective measures and to identify any errors in the process of data entry. Subsequently, data analytic procedures were used to identify and handle missing values and outliers, to assess continuous variables for normality of distribution and homogeneity of variance, and to handle any deviations from normality. These procedures and the respective analyses are presented below.

3.2.1 Missing data

Examination of frequencies of all the study variables revealed that across the three time-points there were 5 missing data points for education status, 9 missing data points for days of meditation practice, 4 missing data points for paranoia distress, and 15 missing data points for the self-knowledge compartmentalisation phi coefficient. Missing values were handled using the pair-wise method in SPSS which excludes cases with missing values on an analysis by analysis basis. The pairwise method is generally preferable over the list-wise method which involves removing cases with missing values across the whole range of analyses which leads to a significant loss of power and biased estimates (Peugh & Enders, 2004).

3.2.2 Outliers

Further exploratory analyses were conducted to identify the outlier scores of continuous variables and to examine whether outlier scores affected the normality of their distribution.

Outliers were defined as scores that were 3 standard deviations above or below the mean score on the respective variable (Field, 2013). A small number of outliers were identified on age and days of meditation practice, on two baseline variables (paranoia frequency, depression), on one post-intervention variable (paranoia frequency), and on one 1-month follow-up variable (paranoia frequency). Removing the outliers did not change the normality of the distribution of the respective variables and therefore the outliers were retained in the analyses to avoid the loss of statistical power, as also recommended by Field (2013).

3.2.3 Normality of distribution

All continuous variables were examined for the normality of their distribution at all three time-points, both for the total sample and for each group separately. This was conducted by examining the histograms in conjunction with the skewness and kurtosis scores. A variable was normally distributed if the z-scores for skewness was below 3.29 (p <.001) (Field, 2013). The z-scores for skewness and kurtosis were calculated with the formulae below:

$$Z\ skewness = \frac{S-0}{SE\ skewness} \qquad Z\ kurtosis = \frac{\sqrt{K-0}}{SE\ kurtosis}$$

At baseline, the following variables were not normally distributed: age, anxiety, depression, paranoia distress, paranoia frequency, state paranoia, self-knowledge compartmentalisation (phi), and days of meditation practice with *Z* skewness ranging from 3.32 to 9.93. Square root transformations successfully transformed the above distributions to normal, with *Z* skewness ranging from 0.33 to 2.70. Square root transformation was not successful for days of meditation practice and age. Age was successfully transformed to a

normal distribution with a logarithm 10 transformation. Logarithm 10 was not successful for days of meditation practice and therefore non-parametric tests were used for this variable.

At both post-intervention and at the 1-month follow-up, the following variables were found to be not normally distributed: state paranoia, paranoia distress, paranoia frequency, and self-knowledge compartmentalisation (phi), with *Z* skewness ranging from 3.30 to 8.43. Square root transformations successfully transformed all the above distributions to normal, with *Z* skewness ranging from 0.13 to 3.04. Square root transformation was not successful for self-knowledge compartmentalisation (phi), which was successfully transformed to a normal distribution with a logarithm 10 transformation.

3.3 Sample

Figure 2 presents the CONSORT diagram which describes the flow of participants through the different stages of the study (Moher, Schulz, & Altman, 2001). From the initial 451 participants who participated in the screening survey, 203 participants met the study inclusion criteria, 100 participants were randomised to the two meditation conditions, 94 completed the post-intervention measures (6% dropped out), and 84 completed the 1-month follow-up measures (16% dropped out). At the 1-month follow-up five participants dropped out within the Loving Kindness Meditation condition (10%) whereas 11 participations dropped out within the Insight Meditation condition (22%). The difference in drop-out rates between the two conditions at the 1-month follow-up was not significant [$\chi^2(1) = 2.68$, $p = .10$]. For the purposes of the statistical analyses the final total sample consisted of the 84 participants who completed the measures at all three time-points.

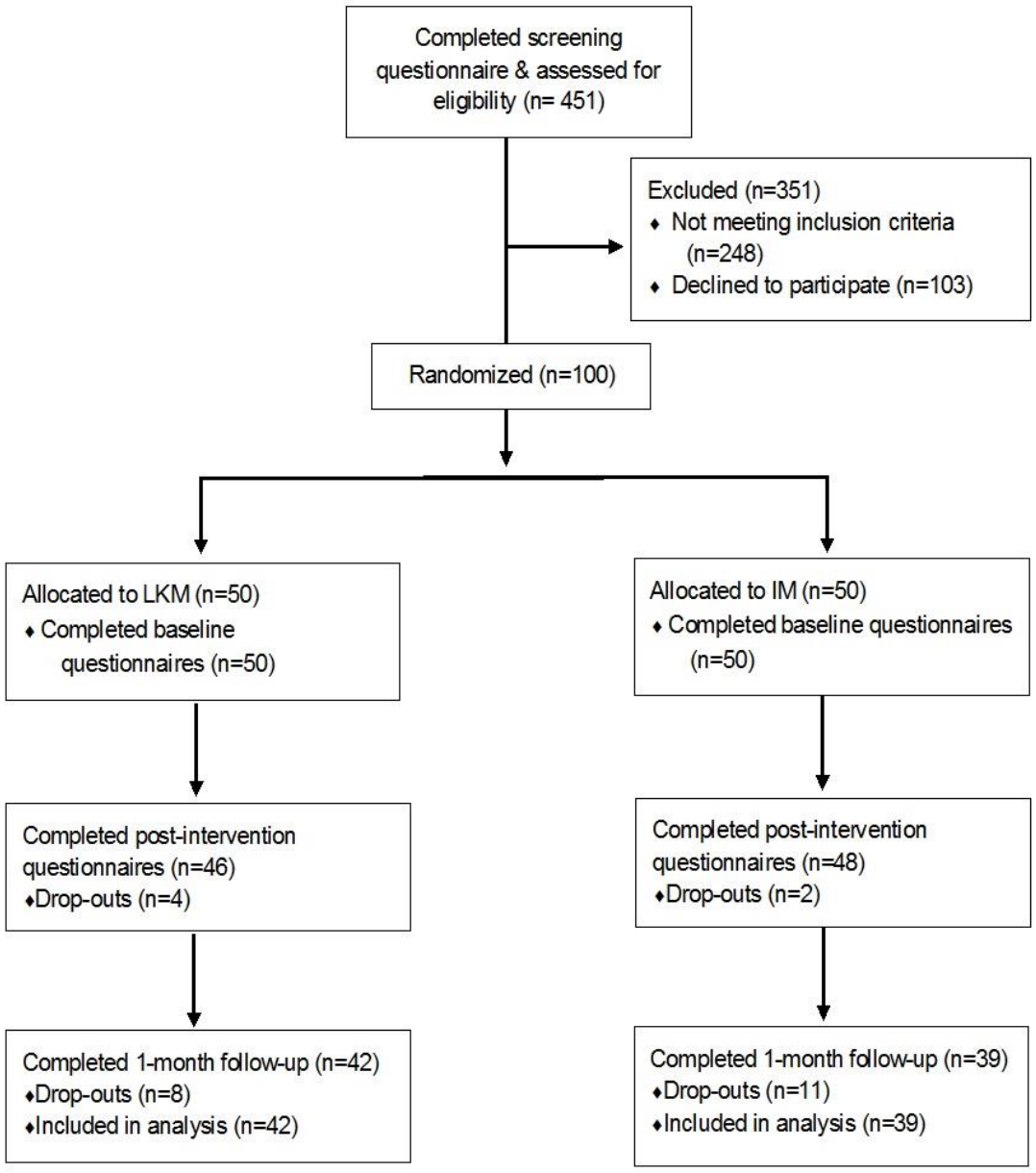

Figure 2: CONSORT diagram of participant flow through the study stages

3.3.1 Sample characteristics

Table 1 presents the demographic characteristics and baseline covariate variables (i.e. baseline anxiety, baseline depression, and baseline trait paranoia) for the total sample (n = 84) and for each of the two meditation conditions (Loving Kindness Meditation n = 45, Insight Meditation n = 39). It also presents the results of the statistical tests that were used to compare the two meditation conditions on their demographic characteristics and baseline covariate variables. Chi-square tests were used for categorical variables, or Fisher's exact tests for categorical variables with cells that had fewer than 5 cases. Independent groups t-tests were used for the baseline covariate variables and for age as these variables were continuous and they, or their transformed scores, met the assumption of normality of distribution of parametric tests. Equal variance estimates were used for the t-tests as the homogeneity of variance assumptions were met for all the covariate variables and age. An independent groups non-parametric test (Mann-Whitney) was used for 'days of meditation practice' as this variable and its transformed scores were not normally distributed. As shown in Table 1, the majority of the participants were female, employed, white British, had a postgraduate degree, did not have a mental health diagnosis, and had prior experience (i.e. knowledge or practice) of mindfulness. Of those who reported that they had practised mindfulness before, the majority perceived themselves as beginners. The statistical tests did not find any significant between-groups differences on any of the demographic or baseline covariate variables. There was therefore no need to control for any of the demographic or covariate variables in any of the further analyses undertaken to test the main hypotheses.

Table 1: Demographics & Baseline Covariate Variables

Variables		**Total sample (*N* = 84)**	**LKM (*N* = 45)**	**IM (*N* = 39)**	**LKM v IM**
Age	Mean (*SD*)	28.20 (8.30)	28.60 (7.88)	27.74 (8.81)	*t (82)* = .699, *p* = .48
Gender	Female Male	71 (84.5%) 13 (15.5%)	37 (82.2%) 8 (17.8%)	34 (87.2%) 5 (12.8%)	χ^2 *(1)* = .39, *p* = .53
Ethnicity	White British White Other Asian British Asian Other Other	54 (64.3%) 17 (20.2%) 3 (3.6%) 3 (3.6%) 7 (8.3%)	29 (64.4%) 8 (17.8%) 1 (2.2%) 1 (2.2%) 6 (13.3%)	25 (64.1%) 9 (23.1%) 2 (5.1%) 2 (5.1%) 1 (2.6%)	χ^2 *(4)* = 4.18, *p* = .38
Employment status	Employed Student Other	43 (51.2%) 36 (42.9%) 5 (6.0%)	25 (55.6%) 18 (40.0%) 2 (4.4%)	18 (46.2%) 18 (46.2%) 3 (7.7%)	χ^2 *(2)* = 0.91, *p* = .64
Educational status	Postgraduate Undergraduate Pre-university	40 (50.6%) 37 (46.8%) 2 (2.5%)	25 (59.5%) 16 (38.1%) 1 (2.4%)	15 (40.5%) 21 (56.8%) 1 (2.7%)	χ^2 *(2)* = 2.87, *p* = .23
Mental Health Diagnosis	Yes No	27 (32.1%) 57 (67.9%)	13 (28.9%) 32 (71.1%)	14 (35.9%) 25 (64.1%)	χ^2 *(1)* = 0.47, *p* = .49
Mindfulness knowledge	Yes No	51 (60.7%) 33 (39.3%)	30 (66.7%) 15 (33.3%)	21 (53.8%) 18 (46.2%)	χ^2 *(1)* = 1.44, *p* = .23

Mindfulness practice	Yes No	43 (51.2%) 41 (48.8%)	26 (57.8%) 19 (42.2%)	17 (43.6%) 22 (56.4%)	χ^2 *(1)* = 1.68, *p* = .19
Mindfulness competence level	Beginner Intermediate	38 (88.4%) 5 (11.6%) *N=43*	24 (92.3%) 2 (7.7%) *N=26*	14 (82.4%) 3 (17.6%) *N=17*	χ^2 *(1)* = .99, *p* = .37
Days of meditation practice	Mean (*SD*)	12.23 (2.00)	11.89 (2.28)	12.58 (1.73)	*U* =816.0, *p* = .21
Baseline trait paranoia	Mean (*SD*)	40.89 *(12.76)*	42.04 *(14.40)*	39.56 (10.58)	*t (81.16)* = .771, *p* = .47
Baseline Anxiety	Mean (*SD*)	9.38 *(8.19)*	9.02 *(7.46)*	9.79 *(9.03)*	*t (82)* = -.140, *p* = .89
Baseline Depression	Mean (*SD*)	10.83 *(8.96)*	10.26 *(9.73)*	11.48 *(8.06)*	*t (82)* = -.971, *p* = .33

3.3.2 Comparison of study completers and drop-outs

A statistical comparison of those who completed the measures at all three time-points against those who dropped out post-intervention or at the 1-month follow-up was undertaken to evaluate whether attrition was systematic. Chi-square tests were used for categorical variables, or Fisher's exact for categorical variables with cells that had fewer than 5 cases. Independent groups t-tests were used for age and the baseline variables as these were continuous and they, or their transformed scores, met the assumption of normality of distribution for parametric tests. Statistical tests did not find any significant differences between study completers (n=94) and post-intervention drop-outs (n=6) on their demographic characteristics or on the baseline variables. However, statistical tests revealed the following significant differences between study completers (n=84) and drop-outs at the

1-month follow-up (n=16): (a) significantly more study completers (61%) than drop-outs (25%) had previous knowledge of mindfulness (χ^2 *(1)* = 6.92, $p < .001$), (b) significantly more study completers (51.2%) than drop-outs (25%) had practised mindfulness before (χ^2 *(1)* = 3.70, $p = .05$), (c) significantly more study completers (50.6%) than drop-outs (18.2%) had a post-graduate degree (χ^2 *(1)* = 7.08, $p < .05$), and (d) study completers had significantly lower levels of baseline repetitive negative thinking [t (98) = -2.49, $p < .05$].

3.4 Main analysis

This section presents the analyses that were undertaken to test each of the study hypotheses. Parametric tests (i.e. Mixed Design ANOVAs) were used for the hypotheses testing as all of the outcome variables, or their transformed scores, met the assumption of normality of distribution. The assumption of sphericity for the repeated measures ANOVAs was checked with Mauchly's Test of Sphericity. When the assumption of sphericity was not met the Huynh-Feldt corrected values were used. For ANOVAS with significant F values follow-up t-tests were conducted for between-groups and within-subjects comparisons, with equal variance estimates when the homogeneity of variance assumption was met and with non-equal variance estimates when it was not met. Table 2 presents the means and standard deviations of the outcome variables for the total sample and for each of the conditions at baseline, post-intervention and at the 1-month follow-up. It also presents some supplementary descriptive information on the self-knowledge compartmentalisation sorting task (i.e. number of self-aspect categories identified, number of self-traits used, and percentage of negative self-traits used). The results are presented below separately for each of the hypotheses.

Table 2: Outcome variables

Variables	LKM (n=45)			IM (n=39)			Total (n=84)		
	T1	**T2**	**T3**	**T1**	**T2**	**T3**	**T1**	**T2**	**T3**
	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)	M (*SD*)
Paranoia frequency	11.86 *(10.44)*	8.11 *(8.50)*	8.08 *(8.47)*	9.38 *(7.28)*	6.43 *(6.21)*	7.25 *(6.75)*	10.71 *(9.14)*	7.33 *(7.53)*	7.70 *(7.68)*
Paranoia distress	24.95 *(13.24)*	16.76 *(10.17)*	16.51 *(10.91)*	18.86 *(12.90)*	12.29 *(13.16)*	13.24 *(13.45)*	22.13 *(13.36)*	14.67 *(11.78)*	15.00 *(12.18)*
State paranoia	15.64 *(5.58)*	12.17 *(4.95)*	12.64 *(5.21)*	13.87 (5.52)	10.84 (3.89)	11.53 (4.40)	14.82 *(5.59)*	11.55 *(4.51)*	12.13 *(4.85)*
Worry	51.53 *(7.51)*	47.37 *(8.37)*	47.73 *(7.84)*	50.25 (7.84)	45.94 (7.31)	47.33 *(7.04)*	50.94 *(7.64)*	46.71 *(7.88)*	47.54 *(7.44)*
Rumination	53.57 *(14.45)*	50.02 *(14.98)*	50.55 *(12.90)*	53.82 (12.32)	47.66 (13.44)	48.97 *(13.25)*	53.69 *(13.42)*	48.92 *(12.17)*	49.82 *(13.01)*
Repetitive negative thinking	*37.57 (12.20)*	31.31 *(10.70)*	33.53 *(11.66)*	*34.56 (10.18)*	29.82 (13.77)	30.46 (12.36)	35.17 *(11.34)*	30.61 *(12.17)*	32.10 *(12.02)*
Self-Knowledge Compartmentalisation (phi)	.65 *(.23)*	.54 *(.22)*	.60 *(.22)*	.67 (.17)	.60 (.23)	.58 (.23)	.66 *(.21)*	.57 *(.22)*	.60 *(.23)*

Self-Knowledge aspects (n)	6.47 *(1.90)*	4.88 *(1.83)*	4.61 *(1.65)*	6.18 *(1.83)*	5.32 *(1.80)*	4.94 *(1.97)*	6.34 *(1.86)*	5.09 *(1.81)*	4.76 *(1.80)*
Self-Knowledge traits (n)	58.49 *(29.43)*	42.21 *(25.38)*	39.61 *(20.63)*	52.12 *(27.88)*	45.66 *(27.23)*	44.89 *(26.97)*	55.58 *(28.73)*	43.83 *(26.16)*	42.06 *(23.72)*
Self-Knowledge Negative Traits (%)	.36 *(.18)*	.28 *(.22)*	.29 *(.23)*	.32 *(.15)*	.23 *(.14)*	.28 *(.19)*	.34 *(.17)*	.26 *(.19)*	.29 *(.21)*

3.4.1 Hypothesis I

Both Insight Meditation and Loving Kindness Meditation will reduce non-clinical paranoia and paranoia distress. A 3 (time: baseline, post-intervention, 1-month follow-up) by 2 (conditions: Loving Kindness Meditation versus Insight Meditation) mixed design ANOVA was conducted on each of the following dependent variables: paranoia frequency, paranoia distress, and state paranoia. The results are presented separately for each of the paranoia outcomes.

3.4.1.1 Paranoia frequency

There was a highly significant within-subjects effect [F (2,164) = 26.80, $p < .001$] on paranoia frequency. Within-groups t-tests for the total sample showed a highly significant reduction in paranoia frequency from baseline to post-intervention [t (83) = 7.18, $p < .001$, d = 0.78], and from baseline to 1-month follow-up [t (83) = 5.88, $p<.001$, d = 0.64]. There was no significant

change in paranoia frequency from post-intervention to 1-month follow-up [*t* (83) = -0.32, *p* = .74]. There was not a significant between-groups effect [F (1,82) = 0.78, *p* = .38] nor a significant interaction between groups and time [F (2,164) = 0.89, *p* = .41] on paranoia frequency (Table 2).

3.4.1.2 Paranoia distress

There was a significant within-subjects effect on paranoia distress [F (2, 156) = 57.17, *p* < .001]. Within-groups t-tests for the total sample showed a significant reduction in paranoia distress from baseline to post-intervention [*t* (79) = 10.22, *p* < .001, d = 1.14], and from baseline to 1-month follow-up [*t* (80) = 8.09, *p* < .001, d = 0.90]. There was no significant change in paranoia distress from post-intervention to 1-month follow-up [*t* (81) = -0.40, *p* = .69]. Moreover, there was a significant between-groups effect [F (1,78) = 6.05, *p* < .05]. Pairwise comparisons revealed that regardless of time-points, participants who practised Loving Kindness Meditation reported significantly higher levels of paranoia distress (Mean = 19.40) than participants who practised Insight Meditation (Mean = 14.80) *(p < .05)*. There was not a significant interaction between groups and time [F (2, 156) = 0.51, *p* = .60] on paranoia distress (Table 2).

3.4.1.3 State paranoia

There was a highly significant within-subjects effect [F (2,164) = 25.50, *p* < .001] on state paranoia. Within-groups t-tests for the total sample showed a highly significant reduction in state paranoia from baseline to post-intervention [*t* (83) = 7.19, *p* < .001, d = 0.78], and from baseline to 1-month follow-up [*t* (82) = 4.82, *p* < .001, d = 0.52]. There was no significant

change in state paranoia from post-intervention to 1-month follow-up [*t* (83) = -1.36, *p* = .18]. There was not a significant between-groups effect [F (1,82) = 2.25, *p* = .14] nor a significant interaction between groups and time [F (2,164) = 0.25, *p* = .78] on state paranoia.

3.4.2 Hypothesis II

Both Insight Meditation and Loving Kindness Meditation will reduce rumination, worry, and repetitive negative thinking but Insight Meditation is expected to be more effective than Loving Kindness Meditation. A 3 (time: baseline, post-intervention, 1-month follow-up) by 2 (conditions: Loving Kindness Meditation versus Insight Meditation) mixed design ANOVA was conducted on each of the following dependent variables: worry, rumination, and repetitive negative thinking. The results are presented below.

3.4.2.1 Worry

There was a highly significant within-subjects effect [F (2, 164) = 20.61, *p* < .001] on worry. Within-groups t-tests for the total sample showed a highly significant reduction in worry from baseline to post-intervention [*t* (83) = 6.44, *p* < .001, d = 0.70], and from baseline to 1-month follow-up [*t* (83) = 4.78, *p* < .001, d = 0.52]. There was no significant change in worry from post-intervention to 1-month follow-up [*t* (83) = -1.18, *p* = .24]. There was not a significant between-groups effect [F (1, 82) = 0.49, *p* = .48], nor a significant interaction between groups and time [F (1,164) = 0.32, *p* = .72] on worry (Table 2).

3.4.2.2 Rumination

There was a highly significant within-subjects effect [F (2, 164) = 11.43, *p* < .001] on rumination. Within-groups t-tests for the total sample showed a highly significant reduction

in rumination from baseline to post-intervention [*t* (83) = 4.22, *p* < .001, d = 0.46], and from baseline to 1-month follow-up [*t* (83) = 3.36, *p* < .001, d = 0.36]. There was no significant change in rumination from post-intervention to 1-month follow-up [*t* (83) = -0.96, *p* = .34]. There was not a significant between-groups effect [F (1, 82) = 0.24, *p* = .63], nor a significant interaction between groups and time [F (2, 164) = 0.77, *p* = .46] on rumination (Table 3).

3.4.2.3 Repetitive negative thinking

There was a highly significant within-subjects effect [F (2, 164) = 19.10, *p* < .001] on repetitive negative thinking. Within-groups t-tests for the total sample showed a highly significant reduction in repetitive negative thinking from baseline to post-intervention [*t* (83) = 5.46, *p* < .001, d = 0.59], and from baseline to 1-month follow-up [*t* (83) = 4.48, *p* < .001, d = 0.48]. There was no significant change in repetitive negative thinking from post-intervention to 1-month follow-up [*t* (83) = -1.81, *p* = .07]. There was not a significant between-groups effect [F (1, 82) = 1.14, *p* = .28], nor a significant interaction between groups and time [F (2, 164) = 0.47, *p* = .62] on repetitive negative thinking (Table 2).

3.4.3 Hypothesis III

Both Insight Meditation and Loving Kindness Meditation will reduce self-knowledge compartmentalisation. A 3 (time: baseline, post-intervention, 1-month follow-up) by 2 (conditions: Insight Meditation versus Loving Kindness Meditation) mixed design ANOVA was conducted on self-knowledge compartmentalisation as measured with the phi-coefficient (Showers, 1992). The results are presented below.

3.4.3.1 Self-knowledge compartmentalisation

As it can be seen on Table 2, the total sample produced an average of 6.3 groups at baseline representing various aspects of themselves or their lives. Participants used an average of 55.6 traits to describe their self-aspect categories, with an average 34% of the traits being negative. Moreover, the average index of compartmentalisation (phi coefficient) for the total sample at baseline was 0.66, with 1 indicating a perfectly compartmentalised self-knowledge organisation and 0 a random self-knowledge organisation. Some illustrative examples of self-aspect categories that participants identified were: wife, son, at university, at work, me on my own, me with friends, dancing, carer, feelings about the world.

There was a highly significant within-subjects effect [F (2, 134) = 6.68, $p < .001$] on self-knowledge compartmentalisation. Within-groups t-tests for the total sample showed a highly significant reduction in self-knowledge compartmentalisation from baseline to post-intervention [t (72) = 3.76, $p < .001$, d = 0.44], and from baseline to 1-month follow-up [t (74) = 2.53, $p < .05$, d = 0.28]. There was no significant change in self-knowledge compartmentalisation from post-intervention to 1-month follow-up [t (69) = -0.41, $p = .68$]. There was not a significant between-groups effect [F (1,67) = 0.25, $p = .62$], nor a significant interaction between groups and time [F (2,134) = 1.00, $p = .37$] on self-knowledge compartmentalisation (Table 2).

4 Discussion

4.1 Overview

The current study addressed a number of gaps in the literature regarding the effects of mindfulness on non-clinical paranoia by comparing the effects of two different types of mindfulness meditations, Loving Kindness Meditation and Insight Meditation, on non-clinical paranoia-related outcomes and on psychological processes that are implicated in the development and maintenance of paranoia. Specifically, the study assessed the differential impact of Insight Meditation and Loving Kindness Meditation on (a) paranoia frequency, paranoia distress, and state paranoia, (b) on worry, rumination, and repetitive negative thinking, and (c) on self-knowledge compartmentalisation, in a non-clinical sample of individuals who scored high on a measure of trait paranoia and paranoia distress. This chapter discusses the findings of the current study separately for each of the study hypotheses by locating them in the context of relevant theory and research that has been discussed in the introduction. A section follows that outlines the key implications of the study findings for clinical psychology practice, followed by a section presenting the methodological strengths and limitations of the current study. The chapter then presents a section that summarises the author's recommendations for future research in the context of areas that are related to the current study and that have been identified as requiring further investigation. The chapter closes with the conclusions of the study.

4.2 Main findings

This section discusses the study findings for each of the three study hypotheses and presents their theoretical implications in the context of existing research and relevant literature.

4.2.1 The effects of Loving Kindness Meditation and Insight Meditation on paranoia frequency, paranoia distress, and state paranoia

The current study aimed to compare two mindfulness meditations, namely Loving Kindness Meditation and Insight Meditation, on paranoia frequency, on paranoia distress, and on state paranoia in a non-clinical sample who scored high on baseline measures of trait non-clinical paranoia or paranoia distress.

Firstly, it is worth noting that nearly half of the participants who took part in the screening survey met the thresholds of high non-clinical paranoia as those were defined for the purposes of the current study [i.e. score above the normative mean score of 42 on the Paranoia Scale (Fenigstein & Vanable, 1992), or score 'moderately distressing' on at least two items of the Paranoia Checklist distress subscale (Freeman et al., 2005)]. It should be noted that the proportion of individuals who met the study criteria for high non-clinical paranoia was much higher than the number reported in a previous study which also recruited individuals with high non-clinical paranoia (Combs et al., 2013). The authors of that study reported that from a group of 146 students they identified 26 who were classified as having high non-clinical paranoia corresponding to a rate of 18% (Combs et al., 2013). This is partly because the cut-off for high non-clinical paranoia that was used in the current study was lower than the one that was used in previous studies. The cut-off score in the current study was any score above the normative mean on the Paranoia Scale (i.e. above 42) whereas

previous studies defined high non-clinical paranoia as any score above 1 standard deviation above the normative mean on the Paranoia Scale (i.e. above 53) (Combs et al., 2013, 2006; Combs & Penn, 2004; Fenigstein, 1997). The proportion of participants that met the criteria for high non-clinical paranoia in the current study also appears to be higher than the numbers reported in studies of paranoia prevalence in non-clinical populations (Bebbington et al., 2013; Freeman et al., 2005). For example, a review of epidemiological studies of paranoia found that 30% of the study participants reported thoughts reflecting more general interpersonal sensitivities and mistrust, whilst 9% reported that there had been times when they felt that people were deliberately acting to harm them (Bebbington et al., 2013). However, the large proportion of individuals who met the study thresholds of high non-clinical paranoia in the current study is in line with Ellett and colleagues (2003) who also found that almost half of their sample reported an experience of paranoia including a planned intention of harm. Collectively these studies suggest that it is important to consider why paranoia appears to be so common in non-clinical populations. Ellett and colleagues (2003) discuss a potential explanation for the high prevalence of non-clinical paranoia highlighting an evolutionary perspective, in that paranoia permits detection of threat to self by others and therefore it is an ordinary cognitive process with an adaptive value in that it keeps individuals safe. They further propose that clinical paranoia is potentially "a systematized and overgeneralized form of an ordinary and adaptive psychological process" (Ellett et al., 2003, p. 429).

Another reason for the large proportion of participants who met the cut-offs for high paranoia in the current study is that high non-clinical paranoia was defined not only based on

the reported frequency of paranoid thoughts but also based on the reported psychological distress. To the author's knowledge this is the first study that used distress as an additional criterion for selecting a group with high non-clinical paranoia. The reason why distress associated with paranoid thoughts was selected as an additional inclusion criterion in the current study is because this is a highly relevant dimension of paranoia and one that is often the target of psychological interventions (Chadwick et al., 2009; Ellett, 2013; Foster et al., 2010). This is important, as some participants may not have scored high on the Paranoia Scale, yet they still reported that they experienced moderate distress related to at least two paranoid thoughts. The large number of individuals who met the study cut-offs of high non-clinical paranoia based on distress is in line with the evidence that paranoid thoughts are fairly distressing in non-clinical populations. For example, Freeman and colleagues (2005) report that 3-34% of their participants experienced some level of distress associated with individual paranoid thoughts as measured with the distress scale of the Paranoia Checklist. To sum up, the high proportion of participants who met the study cut-offs for high non-clinical paranoia further attests to the theory that paranoia exists on a continuum with normal experience (Bebbington et al., 2013; Ellett, 2013; Ellett & Chadwick, 2007; Freeman, 2006; Freeman et al., 2005), and justifies the need to identify psychological interventions aimed at addressing its psychological effects in non-clinical populations.

In line with the first study hypothesis, both Insight Meditation and Loving Kindness Meditation were found to be effective in reducing non-clinical paranoia, not only in terms of the frequency of paranoid thoughts, but also in terms of the psychological distress associated with such thoughts, and momentary experiences of paranoid thoughts (i.e. state paranoia).

The effect sizes for both the pre - post comparisons and the pre - 1-month follow-up comparisons were predominantly large (pre - post: d = 0.78 to 1.14 / pre - 1-month follow-up: d = 0.52 to 0.90), suggesting that both mindfulness interventions were highly effective in reducing paranoia frequency, paranoia distress, and state paranoia in a non-clinical sample who scored high at baseline on trait paranoia or paranoia distress. The study findings support the first study hypothesis which predicted that both meditations would reduce paranoia frequency, paranoia distress, and state paranoia on the basis of preliminary evidence that (a) practice of Insight Meditation was an effective intervention for trait paranoia in a non-clinical sample when compared to a waitlist control condition (Shore et al., in submission) and that (b) practice of Loving Kindness Meditation has demonstrated promising effects in psychosis (Johnson et al., 2009). The finding of the current study that Loving Kindness Meditation was as effective as Insight Meditation also lends support to the suggestion that Loving Kindness Meditation is a relevant psychological intervention for paranoia due its explicit focus on increasing kindness and compassion towards others (Hofmann et al., 2011).

Of importance are the ways in which the current study advanced the limited existing knowledge on the effects of mindfulness interventions for non-clinical paranoia. A first important point is related to the finding that the effects of both Loving Kindness Meditation and Insight Meditation on the paranoia-related outcomes remained not only statistically significant from pre-intervention to 1 month after the end of the interventions, but also potentially clinically important as suggested by the effect sizes which ranged from medium (for paranoia frequency and state paranoia) to large (for paranoia distress) based on Cohen's d (Cohen, 1992). This finding is of particular significance as Shore and colleagues

demonstrated that when compared to a waitlist control condition Insight Meditation was highly effective in reducing non-clinical paranoia in the immediate period following the intervention (i.e. immediately after the intervention and 1 week later) (in submission). The extent to which these effects were retained over a longer period of time remained unclear (Shore et al., in submission). The current study confirmed that the effects of Insight Meditation on measures of paranoia are lasting beyond the immediate week after the end of the intervention. The current study also demonstrated a similar pattern of effects over time for Loving Kindness Meditation. Another way in which the current study has extended Shore and colleagues' findings (in submission), is by demonstrating the effects of Insight Meditation and Loving Kindness Meditation on state paranoia, and on the psychological distress associated with paranoid thoughts. These are significant facets of paranoia that have been targeted as primary outcomes in existing studies of psychological interventions for clinical or non-clinical paranoia (Ellett, 2013; Foster et al., 2010; Lincoln, Hohenhaus, & Hartmann, 2013), albeit they were missing from Shore and colleagues' study (in submission). Moreover, the frequency of paranoid thoughts alone is not necessarily a sufficient outcome of psychological interventions for paranoia, as an individual may experience substantial distress in relation to paranoid thoughts that he/she experiences infrequently.

Of interest is also a comparison of the current study findings with the existing studies of mindfulness interventions for psychosis and for clinical paranoia in particular. The statistically significant effects observed in the current study appear to be consistent with meta-analytic data suggesting that mindfulness interventions are effective in improving positive and negative symptoms of psychosis with medium effect sizes found both in pre - post analyses

(Hedge's g = 0.52) and in pre – follow-up analyses (Hedge's g = 0.62) (Khoury et al., 2013). They are also consistent with two studies that found that Insight Meditation practice was associated with reductions of a medium effect size in clinical paranoia in pre - post analyses (Chadwick et al., 2009, 2005) and with two case studies which found that practice of Insight Meditation was associated with large improvements in paranoia distress which were also maintained at the 1-month follow-up (Ellett, 2013). The study findings are also in agreement with two recent studies which found that practice of Loving Kindness Meditation was associated with significant improvements of large effect sizes in various affective outcomes in individuals with schizophrenia - spectrum diagnoses (Johnson et al., 2009, 2011). However, no studies to date had compared Loving Kindness Meditation and Insight Meditation in psychosis or in clinical paranoia. Given that the selection of the sample of the current study was based on participants scoring above pre-determined thresholds of high non-clinical paranoia, the findings have potential relevance for clinical paranoia. They imply that Loving Kindness Meditation is possibly as effective an intervention as Insight Meditation in addressing the frequency and distress associated with the experience of persecutory delusions. Of course, this is an area that requires empirical validation with a clinical sample. This will be further discussed in the section that outlines directions for future research.

Lastly, of interest is the comparison of the findings of the current study with studies that have compared Loving Kindness Meditation and Insight Meditation on various psychological outcomes. On the one hand, it appears that the findings of this study are consistent with part of the limited evidence base on the comparative effects of Insight Meditation and Loving Kindness Meditation which suggests that the two meditations appear to be equally effective

in improving psychological outcomes such as mindfulness, acceptance, anxiety, positive and negative affect, irrational beliefs, coping strategies, and hope (May et al., 2012; Sears & Kraus, 2009). On the other hand, the lack of significant differences between the two meditations is in contrast with studies which show that they do have differential effects, including on self-positivity bias and decentering (Feldman et al., 2010; Logie & Frewen, 2015). The lack of consistent findings in the literature about the differential effects of Loving Kindness Meditation and Insight Meditation could be partly because the existing studies have measured different psychological outcomes and it is likely that the two meditations have indeed distinct effects on different psychological variables. There are also methodological limitations of the existing studies that may explain the inconsistent findings regarding the differential effects of the two meditations, including small sample sizes and lack of uniformity in the way the interventions were delivered. More importantly, only recently have researchers started investigating how these two mindfulness meditations differ in terms of their effects on psychological variables and therefore there is not sufficient empirical data to ascertain whether Loving Kindness Meditation and Insight Meditation have indeed distinct effects. Lastly, it is worth considering that alongside their potentially discrete mechanisms of change due to their distinct content, the two meditations may also impact on psychological outcomes through certain common processes. For example, a purposeful redirection of participants' attention, relaxation, time spent on a regular basis with the intent to focus on internal experiences might be characteristics that the two meditations have in common which might explain their similar effects on the study variables. This is an area that would be worth

exploring in future research on the comparative effects of Loving Kindness Meditation and Insight Meditation on psychological outcomes such as paranoia.

Along with the effects of the Insight Meditation and Loving Kindness Meditation on dimensions of paranoia, it is important to examine their impact on psychological processes that have been shown to be implicated in the development and maintenance of paranoia. As a first step in this process, the study aimed to investigate the differential impact of Loving Kindness Meditation and Insight Meditation on two categories of psychological processes that have been inferred in the onset and persistence of paranoia and paranoia distress: a worry thinking style and self-related processes. The current study has specifically looked at the effects of the two meditations on repetitive types of thinking (i.e. worry, rumination and repetitive negative thinking), and on a self-related construct that has not been researched before in relation to paranoia, that is self-knowledge organisation. The study findings in relation to repetitive types of thinking and self-knowledge organisation are discussed below.

4.2.2 The effects of Loving Kindness Meditation and Insight Meditation on worry, rumination, and repetitive negative thinking

A worry thinking style, encompassing repetitive forms of negative thinking such as worry and rumination, is one of the key psychological processes that are theoretically implicated in the development and maintenance of paranoia (Chadwick et al., 2005; Freeman & Garety, 2014, 1999), as also supported by a substantial amount of research studies of a range of methodological designs (Dunn et al., 2015; Freeman et al., 2013; Freeman et al., 2008, 2011, Freeman & Garety, 2014, 1999; Martinelli et al., 2013; Simpson et al., 2012). In line with the second study hypothesis, all three types of repetitive thinking were found to significantly

reduce after both mindfulness meditations with the reductions remaining significant 1 month after the end of the interventions. The effect sizes of the reductions varied from medium to small. The largest effects were observed for worry (d = 0.70 from baseline to post-intervention, d = 0.52 from baseline to 1-month follow-up), followed by repetitive negative thinking (d =0.59 from baseline to post-intervention, d = 0.48 from baseline to 1-month follow-up), and lastly by rumination (d = 0.46 from baseline to post-intervention, d = 0.36 from baseline to 1-month follow-up). Moreover, and against the prediction that Insight Meditation would be more effective than Loving Kindness Meditation on repetitive forms of thinking, no significant differences were found between the two mindfulness meditations on their effects on the three types of repetitive thinking.

It appears that both Insight Meditation and Loving Kindness Meditation are effective in reducing repetitive forms of negative thinking, with worry sustaining the largest reduction. This is in line with existing theories such as the Differential Activation Hypothesis model of depression relapse (Teasdale et al., 1995), which supports that practice of Insight Meditation facilitates a heightened awareness of and disengagement from repetitive forms of thinking which are factors perpetuating psychological suffering such as depression and anxiety (Teasdale et al., 2000). The findings are also consistent with the vast emerging evidence that worry and rumination are significant mediators of the effects of Insight Meditation interventions on mental health outcomes such as anxiety, depression, psychopathological symptoms, stress and negative affect (Gu et al., 2015). However, this is the first study to the author's knowledge demonstrating that repetitive forms of thinking such as worry and rumination are psychological processes that can also be reduced after the practice of a

compassion-focused mindfulness meditation, namely Loving Kindness Meditation. This is of theoretical interest, as Loving Kindness Meditation is a meditation that emphasizes generating and directing kindness and warmth towards the self and others (Hofmann et al., 2011) rather than explicitly guiding meditators to disengage from repetitive thoughts in a way that Insight Meditation does (Bishop et al., 2004). Of interest is therefore the association between practice of Loving Kindness Meditation and reduced worry, rumination, and repetitive negative thinking. Preliminary studies have found that higher self-compassion is associated will lower ruminative thinking and lower worry (Krieger, Altenstein, Baettig, Doerig, & Holtforth, 2013; Neff & Vonk, 2009; Raes, 2010), which could imply that the observed reduction in repetitive forms of negative thinking in the current study is possibly explained by a simultaneous increase in compassion-related outcomes. However, compassion was not directly measured in the current study, so it is not possible to draw any clear conclusions about this. Future research might usefully measure compassion for self and others.

It is also worth adding that repetitive types of thinking were included as outcome variables in the current study, rather than as potential mediators of the effects of Loving Kindness and Insight Mindfulness Meditations on paranoia-related outcomes. A mediation analysis aimed at investigating whether repetitive types of thinking mediate the effects of the two meditations on paranoia-related outcomes is an area that future studies should try to undertake. This is particularly pertinent in the context of theoretical and empirical literature suggesting that a worry thinking style and rumination are psychological factors that are implicated in the development and maintenance of paranoid thoughts and associated distress

(Chadwick et al., 1996; Foster et al., 2010; Freeman et al., 2011; Freeman, 2007; Freeman et al., 2011, 2002; Freeman & Garety, 1999; Martinelli et al., 2013; Simpson et al., 2012).

4.2.3 The effects of Loving Kindness Meditation and Insight Meditation on self-knowledge compartmentalisation

Psychological processes related to the content of individuals' perceptions about the self, such as global self-esteem, self-worth, specific self-evaluations, and implicit self-esteem, have been consistently related to paranoia in psychosis (Tiernan et al., 2014), and also in non-clinical populations (Ellett & Chadwick, 2007; Fowler et al., 2006; Freeman et al., 2014; Gracie et al., 2007; Oliver et al., 2012). Negative beliefs about the self as vulnerable are described in the cognitive model of paranoia as both causal factors and also as consequences of paranoid thoughts (Freeman, 2007; Freeman & Garety, 2014). A self-related process which is concerned with the organisation of one's self-knowledge and which has not to date been investigated in relation to paranoia is self-knowledge compartmentalisation, the degree to which negative and positive perceived attributes are integrated or compartmentalised across different self-aspect categories (Showers, 1992).

In line with the final study hypothesis, the statistical analyses showed that self-knowledge compartmentalisation was significantly reduced from baseline to post-intervention after practice of Insight Meditation or Loving Kindness Meditation, with the effects remaining significant 1 month after the end of the interventions. The effect sizes of the reductions were small both for the comparisons from baseline to post-intervention ($d = 0.44$) and from baseline to 1-month follow-up ($d = 0.28$). Moreover, there were not any significant differences between the two meditations on their effects on self-knowledge

compartmentalisation. These findings are consistent with earlier studies which have found that both Insight Meditation and Loving Kindness Meditation have a positive impact on self-related constructs such as self-compassion, self-esteem, and self-acceptance (Johnson et al., 2009; Kuyken et al., 2010; Pepping et al., 2013; Shahar et al., 2015). There appear to be theoretical grounds on why higher levels of integration of positive and negative self-attributes would be observed after both types of mindfulness meditations. Insight Meditation is thought to influence positively the perspective of the self through encouraging a non-judgemental observation of internal experiences such as negative thoughts about the self (Hölzel et al., 2011), whereas Loving Kindness Meditation through fostering a kinder and more compassionate attitude towards oneself (Hofmann et al., 2011). The distinct mechanisms through which the two types of mindfulness mediations might influence the ways in which individuals organise their perceived attributes about their self remain to be established in future research.

The model of self-knowledge compartmentalisation postulates that lower levels of compartmentalisation are preferable for mood and self-esteem when negative self-aspects are more salient (Showers, 1992; Showers et al., 2015). This is of particular relevance for individuals who experience high levels of paranoia and are therefore expected to perceive their self negatively (i.e. as vulnerable). The higher integration of positive and negative perceived self-attributes that was observed in the current study following the practice of Insight Meditation and Loving Kindness Meditation is therefore expected to be beneficial for individuals with high levels of paranoia in terms of their mood and self-esteem. However, it should be noted that the observed effects of Insight Meditation and Loving Kindness

Meditation on self-knowledge compartmentalisation were of a small size and therefore the extent to which self-knowledge compartmentalisation is a psychological variable that is amenable to change following the practice of Insight Meditation or Loving Kindness Meditation is unclear and remains to be established in future studies. Moreover, to the author's knowledge there is not any existing research on the relationship between self-knowledge compartmentalisation or other types of self-knowledge organisation and paranoia and therefore the extent to which self-knowledge compartmentalisation is a self-related process that is indeed related to paranoia and the nature of their relationship requires further investigation. Lastly, there are other self-related constructs such as self-esteem which were not measured in the current study and that research indicates as highly pertinent paranoia-related processes (Tiernan et al., 2014). The effects of Insight Meditation and Loving Kindness Meditation on self-concepts that are known to be related to paranoia remains therefore to be explored in future research.

4.2.4 Amount of meditation practice

It is important to highlight that the above statistically significant effects on the study variables were observed after only 2 weeks of daily 10-minute practice of Loving Kindness Meditation or Insight Meditation. Research on what constitutes an optimum amount of mindfulness practice for significant effects on psychological wellbeing to occur remains inconclusive, however a narrative review of empirical data of mindfulness-based interventions suggests that amount of meditation practice is important (Baer, 2003). For example, a study on the effects of a Mindfulness-Based Stress Reduction programme for depression and anxiety found that decreases in self-reported rumination were significantly predicted by participants'

amount of meditation practice (Ramel, Goldin, Carmona, & McQuaid, 2004). A more recent research study on the effects of a Mindfulness-Based Stress Reduction programme for adults with a wide range of problems (e.g. illness-related stress, chronic pain, anxiety, and personal and employment-related stress) found that higher engagement with home-based practice mediated the effects of the intervention on psychological symptoms and wellbeing (Carmody & Baer, 2008). Interestingly, a review of studies of various mindfulness interventions presents data which suggest that a significant proportion of study participants reported that they continued to practise mindfulness regularly at various follow-ups after treatment had ended (Baer, 2003).

The current study findings demonstrated that 2 weeks of brief daily meditation practice produced significant effects on paranoia-related outcomes, and repetitive types of thinking, which lasted at least up to 1 month after the end of formal meditation practice. The optimum amount of formal meditation practice, as well the extent to which individuals need to continue meditating after the end of the intervention for the effects to persist in the longer-term are issues that remain to be explored in future research.

4.2.5 Participant engagement with the meditations

Another important issue to consider is the low attrition rates observed in the current study (i.e. 6% of participants dropped out post-intervention and 16% at the 1-month follow up) along with the high participant engagement with the meditation practice (i.e. participants reported that they listened to their meditation an average of 12 out of the expected 14 days). Both pieces of information suggest high levels of participant engagement with the two

meditations. The attrition rate observed in the current study was lower than that reported by Shore and colleagues in their study of an online mindfulness intervention for non-clinical paranoia (i.e. their attrition rate was 28%) (Shore et al., in submission). However, the average days of meditation practice reported by participants in the current study were similar to Shore and colleagues who also found that participants engaged with their online mindfulness intervention an average of 12 days out of the expected 14 (in submission). Collectively, the above data agree with existing research which suggests that participants who enrol in mindfulness interventions tend to complete them (Baer, 2003) and imply that the two tested meditations appear to be acceptable and helpful for study participants. However, the amount of meditation practice was measured through a diary that relied on participants reporting the extent to which they listened to the meditation on each of the 14 days of the intervention. Self-reports are open to social desirability bias and therefore they are not very reliable methods of measuring participants' adherence to the interventions. Future research could benefit from identifying methods for measuring participants' engagement with mindfulness meditations that are not solely based on self-reports.

4.3 Clinical implications

This section discusses the implications of the study findings for addressing the psychological consequences of paranoia in non-clinical populations. The implications of the study findings for the treatment of clinical paranoia are also discussed at the end of the section albeit these should be considered tentatively because the current study used a non-clinical sample.

Firstly, the finding that a large proportion of the individuals who participated in the screening survey scored above the pre-defined thresholds of high trait non-clinical paranoia or moderate distress associated with paranoid thoughts supports the importance of normalising paranoia as an experience that occurs frequently and is therefore an ordinary phenomenon (Bebbington et al., 2013; Ellett, 2013; Ellett & Chadwick, 2007; Ellett et al., 2003; Freeman, 2006; Freeman et al., 2005). Such normalising of paranoia can facilitate individuals' understanding of their experiences and their engagement with psychological interventions aimed at addressing paranoid thoughts and their psychological effects (Ellett et al., 2003; Freeman et al., 2005).

More importantly, the current study demonstrated that two distinct types of mindfulness meditations, Insight Meditation and Loving Kindness Meditation, were significantly and equally effective in reducing not only the frequency of paranoid thoughts, the distress associated with them, and momentary experiences of paranoia (i.e. state paranoia), but also worry, rumination, and repetitive negative thinking. The finding that the above improvements were observed after only 2 weeks of daily brief practice of Loving Kindness Meditation or Insight Meditation highlights the substantial potential of these two mindfulness meditations as psychological interventions that can facilitate great improvements in the wellbeing of individuals with distressing paranoid thoughts with a small amount of resources. Likewise, the fact that these interventions were delivered through audio files that could be accessed at a time and place of the participants' convenience highlights the ease and accessibility of the delivered interventions which further supports the case that brief daily practice of Insight Meditation or Loving Kindness Meditation is a potentially highly cost-effective psychological

intervention for individuals who experience distressing non-clinical paranoia. Practice of Insight Meditation or Loving Kindness Meditation could therefore be incorporated into community-based psychological interventions for psychological wellbeing that might be accessed by interested individuals at non-clinical settings (e.g. occupational or educational settings). Moreover, practice of Insight Meditation or Loving Kindness Meditation could be recommended as a component of psychological interventions for individuals who present in mental health services with subclinical levels of paranoia (e.g. mild levels of distressing suspicious thoughts). The finding that both meditations were equally effective on all the study variables suggests that Insight Meditation and Loving Kindness Meditation could be used interchangeably as practices aimed at easing the burden of paranoid thoughts and therefore service users could have greater choice in terms of selecting the type of meditation that fits more with their needs and preferences. Another important point relates to the high levels of participants' engagement with both mindfulness interventions, as supported by the self-report data on their adherence to the meditation practice (i.e. an average of approximately 12 out of the required 14 days for both groups) and the low drop-out rates (i.e. 6% post-intervention, 16% at the 1-month follow up). The high levels of engagement with both meditations imply that participants potentially found the interventions interesting, easy to follow, and helpful which further attests to their relevance as psychological interventions that have high potential in paranoia.

The present study also demonstrated the effects of Insight Meditation and Loving Kindness Meditation on the ways in which the knowledge about the self is organised, suggesting that the ways in which participants thought about themselves after practising

Insight Meditation or Loving Kindness Meditation became more integrated, with positive and negative attributes co-existing rather than self-aspects being defined by negative only or positive only attributes. This implies higher flexibility in the ways individuals started perceiving themselves, which is consistent with Chadwick's proposal that individuals with psychotic symptoms need help to move from "a fixed, simplified and emotionally negative perspective of the self towards a complex, contradictory, changing and emotionally varied model of the self" (Chadwick, 2003, p. 440). Both Insight Meditation and Loving Kindness Meditation are therefore potentially useful psychological strategies for helping individuals to create more flexibility in the ways in which they perceive themselves. Higher flexibility in individuals' self-perceptions is also likely to positively influence the degree of and distress associated with paranoid thoughts, especially considering the role of negative self-beliefs in the development and maintenance of paranoia (Freeman & Garety, 2014; Tiernan et al., 2014). It should be noted of course that the size of the effects of Insight Meditation and Loving Kindness Meditation on self-knowledge compartmentalisation were small and therefore the clinical importance of the observed effects requires further investigation.

The study findings also hold potential implications for the treatment of clinical paranoia. This is because the participants were selected on the basis of scoring high on measures of paranoia, and also because the continuum theory of paranoia supports that clinical paranoia lies on the severe end of common paranoid thoughts (Combs & Penn, 2004; Freeman & Garety, 2014). The study findings might therefore imply that practice of Loving Kindness Meditation or Insight Meditation is a potentially effective psychological strategy in the treatment of persecutory delusions. If this is confirmed with clinical studies, it could be of

great clinical importance especially as mainstream psychological interventions such as traditional Cognitive Behavioural Therapy have been found to have small effects on delusional beliefs (Van der Gaag et al., 2014). Lastly, the observed improvements in worry, rumination, and repetitive negative thinking, all of which are trans-diagnostic psychological processes that are implicated in the development and maintenance of various mental health symptoms (Ehring et al., 2011), imply that Insight Meditation and Loving Kindness Meditation are also potentially relevant psychological tools in the treatment of a wider range of psychological problems many of which often co-exist with clinical and non-clinical paranoia, such as anxiety and depression (Freeman et al., 2011).

4.4 Strengths and limitations

This section discusses the methodological strengths and limitations of the current study. It starts with a summary of the strengths and novel contributions that the current study has made to the knowledge base on the effects of mindfulness for paranoia, and it ends with a summary of the methodological limitations that should be considered when interpreting the study findings.

4.4.1 Study strengths

The most significant strengths of the current study are related to its novel contributions in the broader area of mindfulness for paranoia. Firstly, this is the first study to the author's knowledge that compared the effects of two different types of mindfulness meditations on paranoia in clinical or non-clinical populations. It is also the first study that investigated the effectiveness of Loving Kindness Meditation for clinical or non-clinical paranoia. Moreover,

this is the first study that compared the effects of two mindfulness interventions using a randomised design on processes that are implicated in the development and maintenance of paranoid beliefs (i.e. repetitive forms of thinking such as worry and rumination). Lastly, it is the first study that investigated the impact of mindfulness interventions on a self-related process that has yet to be researched as a concomitant of paranoia but is proposed to be of relevance, that is self-knowledge compartmentalisation.

Of importance is also the fact that the current study investigated the effects of the two mindfulness meditations on different aspects of paranoia including not only on the frequency of paranoid beliefs but also on the distress experienced by individuals and a state measure of non-clinical paranoia. These aspects have been discussed in the literature as important dimensions of the experience of paranoid beliefs (Freeman et al., 2005, 2002). Regarding paranoia distress in particular, it has been argued that it should be a target of psychological interventions especially for individuals who are less willing to evaluate their paranoid beliefs (Freeman et al., 2002). For those individuals, a psychological intervention aimed at addressing the emotional distress experienced in relation to paranoid beliefs could be a more relevant approach of emotional support than attempting to reduce the extent to which the individuals experience these beliefs (Freeman et al., 2002). The inclusion of different dimensions of paranoia as outcomes is also another way in which the current study extends the findings of the first and only existing study of mindfulness for non-clinical paranoia (Shore et al., in submission).

Another strength of the current study is the improved generalisability of its findings when compared to studies of non-clinical paranoia which have used participants from a student

population (Ellett et al., 2003; Freeman et al., 2005; Simpson et al., 2012). The current study has been conducted with a more diverse sample, half of which consisted of university students and the other half of individuals who mainly defined themselves as employed. This was facilitated by a variety in methods of participant recruitment, such as the use of social media alongside the use of more traditional methods involving advertisements on the RHUL university campus. Of course, the use of social media as a method for participant recruitment in psychological research is at early stages and therefore assumptions about the reliability of this approach cannot be drawn with confidence. However, early preliminary research suggests that recruiting participants through social media and conducting research on the web does not present with any disadvantages when compared to more traditional methods of participant recruitment and face to face administered psychological research (Casler, Bickel, & Hackett, 2013). On the contrary, it appears that recruiting participants through social media and other web platforms improves the diversity of study samples and does not compromise the quality of the data collected (Casler et al., 2013).

Other methodological strengths of the current study include the use of well-validated scales for the measurement of the study variables, the inclusion of a longer term follow-up (i.e. 1 month post-intervention) which is also an improvement when compared to Shore and colleagues (in submission) whose longest follow-up was 1 week post-intervention, the matching of the two interventions on key characteristics such as length of meditation, voice of recording, and mode of delivery, and lastly the high participant engagement with the interventions as indicated by the participants' self-reports of how many days they listened to their allocated mindfulness meditation.

4.4.2 Study limitations

Certain methodological limitations should also be considered when interpreting the findings of the current study. These are discussed below according to the specific area that they are related to.

4.4.2.1 Study sample

One important limitation is related to the socio-demographic composition of the sample. The sample consisted mainly of female, white British, and highly educated participants. This socio-demographic composition is consistent with previous empirical studies of non-clinical paranoia that also used convenience samples (Ellett et al., 2003; Freeman et al., 2005; Shore et al., in submission; Simpson et al., 2012) and limits the generalisability of the study findings to the wider population of individuals who may experience paranoid beliefs. Moreover, this was a self-selected sample with a large proportion of participants (50% - 60%) reporting that they had previous experience of mindfulness (knowledge of and/or practice of mindfulness). This is likely to indicate that the study participants were highly interested in the study interventions and highly motivated during their participation in the study. This is also supported by the finding that amongst those who dropped out there was a significantly higher percentage of participants who did not have previous experience of mindfulness compared to the group of participants who completed the study. Any attempts to generalise the study findings beyond female, white British, and highly educated individuals who have an interest in mindfulness should therefore be treated with caution.

4.4.2.2 Inclusion criteria

Another caveat is concerned with the inclusion criteria that were used for selecting a sample with high non-clinical paranoia, and subsequently the extent to which the findings can be generalised to individuals with clinical levels of paranoia. The thresholds that were used in the current study were lower than those that have been used in previous research (Combs et al., 2013, 2006). This is also supported by the finding that the total sample's mean score on the Paranoia Scale (Fenigstein & Vanable, 1992) was similar to the mean score that has been reported in studies of non-clinical paranoia which included participants with the whole possible range of paranoia scores (Fenigstein & Vanable, 1992; Freeman et al., 2005). However, an additional inclusion criterion was considered in the present study aimed at capturing not only individuals who experienced frequent paranoid thoughts but also individuals who experienced moderate degree of distress related to paranoid thoughts irrespective of their frequency. This additional inclusion criterion is considered a strength of the current study as it is consistent with theory and research which supports that distress is one very important dimension of paranoia and one that psychological interventions should help address (Freeman et al., 2005, 2002).

4.4.2.3 Lack of control group

The lack of a control group needs also to be discussed as a limitation of this study, as it precludes the possibility to test whether the two interventions were indeed more effective than a control condition. However, this study builds on Shore and colleagues' very recent study which compared Insight Meditation to a waitlist control group and found that Insight Meditation significantly reduced paranoia when compared to the control condition (in submission). The present study demonstrated that Loving Kindness Meditation is as effective

in terms of reducing paranoia frequency and paranoia distress as Insight Meditation, which has already been proved to be more effective than a waitlist control condition (Shore et al., in submission). Future research needs to also establish the effectiveness of the two meditations in comparison to active control conditions such as more mainstream Cognitive Behavioural Therapy based interventions for paranoia.

4.4.2.4 Limited power for small effect sizes

Another limitation is that the study was not sufficiently powered for between-groups differences of a small effect size and therefore the two meditations might have had some differential effects on paranoia and on the examined processes that were not identified. Of course, it should be noted that even if there were any differences between the two meditations these would be of a small effect size and therefore the actual clinical importance of these differences is likely to be *negligible*.

4.4.2.5 Methodological biases

Another set of methodological limitations is concerned with undue influences on the outcomes of interest resulting from various methodological biases. As is common with psychological research that involves self-reported outcomes, it is possible that participants have altered their responses in order to be perceived more favourably, a bias known as social desirability bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This is particularly relevant for research investigating the experience of paranoid beliefs as the social stigma associated with paranoia is likely to influence the participants' willingness to report an honest account of the extent to which they experience paranoid beliefs. This has been mitigated in the

current study by the fact that the aims of the study were not made explicit to the study participants until after they completed their participation. Moreover, the instructions of the paranoia measures normalised thoughts and experiences of suspiciousness and they also encouraged participants to provide honest responses. Another undue influence on the estimated effects might have emerged from participants' increased familiarity with the study measures, as the same measures were used at all three time-points. It is possible that participants' familiarity with the study measures affected their responses over time in ways that were not necessarily representative of their actual thoughts, feelings, and experiences (Podsakoff et al., 2003). Another limitation is that participants' engagement with the interventions was measured with self-reports which might have led to biased estimates of the extent to which participants practised the meditations. Moreover, a small number of participants (n=9) did not return their practice diaries and therefore their adherence to the intervention could not be ascertained. This is another potential source of bias in terms of the estimated effects of the two meditations on the outcomes of interest. Lastly, there was a large number of missing data points on the measure of self-knowledge compartmentalisation (n=15) which might have produced a biased estimate of the effects of the two meditations on this variable.

4.5 Future research

Future research is required to address some of the limitations that were discussed above, and more generally to expand our understanding of the effectiveness of Insight Meditation and Loving Kindness Meditation for paranoia in clinical and non-clinical populations. Firstly, studies with sample sizes that will allow to detect small effect sizes will help ascertain the

extent to which these two meditations produce distinct effects on outcomes related to paranoia. As discussed above, even though the current study did not find any significant differences between the two conditions on any of the outcomes, it is possible that existing differences were not detected because the study was under-powered for between-groups differences of small effect sizes. Another recommendation for future research is the inclusion of an active control group which will help determine the extent to which the two meditations are more effective than other existing interventions for paranoia such as more traditional Cognitive Behavioural Therapy strategies (e.g. thought challenging).

An additional direction for future research is the design of studies that will aim to investigate the mechanisms of change of Insight Meditation and Loving Kindness Meditation on paranoia-related outcomes, as along with studies investigating the effectiveness of mindfulness interventions it is equally important to understand how these interventions work (Baer, 2003; Shapiro et al., 2006). Future studies should continue the investigation of the effects of Insight Meditation and Loving Kindness Meditation on variables that are theoretically and empirically implicated in the development and maintenance of paranoia, such as reasoning biases (e.g. jumping to conclusions), and affective processes (e.g. anxiety, depression) (Freeman et al., 2002; Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). Moreover, advanced statistical methods such as mediation analyses are needed to investigate the exact paths through which the two mindfulness meditations improve paranoia-related outcomes. This will further be facilitated by the inclusion of psychological variables of specific relevance to each of the two meditations. For example, of relevance for future research studies is the measurement of compassion-related variables as potential mediators of the

impact of Loving Kindness Meditation on paranoia-related outcomes, as Loving Kindness Meditation is a compassion-focused meditation (Hofmann et al., 2011).

Future research should also extend the findings of the current study with clinical populations. Although the sample of the current study was selected based on participants' high scores on measures of trait paranoia and paranoia distress, this was a non-clinical sample and therefore the relevance of the study findings for clinical populations needs to be tested with a clinical sample of individuals who experience persecutory delusions. Longer-term follow-ups will also help clarify the extent to which the positive effects of Insight Meditation and Loving Kindness Meditation on paranoia-related outcomes are maintained over a longer period, for example 3 or 6 months after the end of the interventions.

Other areas that could be addressed by future studies include the development of more comprehensive and reliable methods for the assessment of mindfulness practice. This could include the development and validation of questionnaires measuring different aspects of participants' experience of meditating, and also tools for measuring participant's engagement with the interventions that are not based only on self-reports. For example, it might be possible to develop computer or web-based applications through which the mindfulness interventions will be delivered and which will allow to measure the degree of participants' engagement with the meditations in automated ways.

Another area that would be worth exploring in future studies is how paranoid experiences change over time and throughout the duration of the mindfulness interventions. This could be enhanced with the use of Experience Sampling Methods (ESM) which have been used previously in studies measuring momentary experiences of paranoia and related variables

(Collip et al., 2013). Lastly, methodologies such as qualitative study designs involving in depth interviews with individuals who have practised Insight Meditation and Loving Kindness Meditation could be of value as a further step in the investigation of the relevance and acceptability of these interventions for paranoia. These study designs have proven useful for understanding participants' experiences of psychological interventions as they allow to capture aspects of the participants' subjective experience that cannot be assessed with quantitative study designs (Himelstein, Hastings, Shapiro, & Heery, 2012).

4.6 Conclusions

The current study made significant and novel contributions to the existing limited literature on the effectiveness of psychological interventions for non-clinical paranoia. The study findings showed that both Insight Meditation and Loving Kindness Meditation were equally effective in reducing paranoia frequency, paranoia distress, and state paranoia from baseline to post-intervention, with the estimated effects being predominantly of a large size and persisting 1 month after the end of the required 14 days of daily meditation practice. Similarly, Insight Meditation and Loving Kindness Meditation were found to be equally effective in terms of improving worry, rumination and repetitive negative thinking, which are implicated in the onset and maintenance of paranoia, with the effects remaining significant 1 month after the end of the intervention. Significant improvements were also found for self-knowledge compartmentalisation. The study findings demonstrate the significant potential of mindfulness-based interventions that use Insight Meditation and Loving Kindness Meditation as psychological interventions that are easily accessible and highly effective for individuals from a non-clinical population who experience distressing paranoia. They also

highlight the importance of verifying the effectiveness of Insight Meditation and Loving Kindness Meditation for persecutory delusions.

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Appendices

Appendix 1: Study Poster

Interested in learning Mindfulness and being in with the chance of winning vouchers worth a total of £100!

A research study is currently on-going at the Clinical Psychology Department focusing on the effects of mindfulness on thoughts, feelings and well-being.

By taking part in this study, participants will be entered into a prize draw for vouchers worth a total of £100!

This study is open to all RHUL students and staff.

If you are interested in taking part please contact:
Charlotte.snape.2014@live.rhul.ac.uk
Anna.pinto.2014@live.rhul.ac.uk

If you are a member of the Psychology Experiment System, you can also check the study details there (see listings under paid pool only), and book in a time slot to participate in the study.

Thank you
This study has been reviewed and approved by the Psychology Department Ethics Committee, Royal Holloway University London

Mindfulness Study
Contact: charlotte.snape.2014
@live.rhul.ac.uk or
anna.pinto.2014@live.rhul.ac.uk

Appendix 2: Script of Advertisement for Social Media

Are you interested in:

-learning mindfulness

-contributing to research on mental wellbeing

-being in with the chance of winning vouchers worth £100

We are looking for adults, aged above 18, who live in the UK to take part in a Royal Holloway University research study that wants to find out whether two mindfulness meditations can improve mental wellbeing. Mindfulness means paying attention on purpose, in the present moment and non-judgementally. Mindfulness meditation is the practice of turning your attention to a single point of reference such as your breathing.

To learn more about our study, please visit our website:

https://rhulpsychology.eu.qualtrics.com/SE/…

Appendix 3: Study Measures

Paranoia Scale (PS; Feningstein & Vanable, 1992)

Please read each statement below and tick the box that indicates how applicable each statement is to you. It is usually your initial response that is most accurate so please do not spend a long time considering each item.

	Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me
Someone has it in for me.					
I sometimes feel as if I'm being followed.					
I believe that I have often been punished without cause.					
Some people have tried to steal my ideas and take credit for them.					
My parents and family find more fault with me than they should.					
No one really cares much what happens to you.					
I am sure I get a raw deal from life.					
Most people will use somewhat unfair means to gain profit or an advantage, rather than lose it.					
I often wonder what hidden reason another person may have for doing something nice for you.					
It is safer to trust no one.					
I have often felt that strangers were looking at me critically.					

Most people make friends because friends are likely to be useful to them.					
Someone has been trying to influence my mind.					
I am sure I have been talked about behind my back.					
Most people inwardly dislike putting themselves out to help other people.					
I tend to be on my guard with people who are somewhat more friendly than I expected.					
People have said insulting and unkind things about me.					
People often disappoint me.					
I am bothered by people outside, in cars, in stores, etc. watching me.					
I have often found people jealous of my good ideas just because they had not thought of them first.					

Paranoia Checklist-Distress Subscale (Freeman et al., 2005)

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 how distressing the experience is for you.

I sometimes get the thought that:

	Not distressing	A little distressing	Somewhat	Moderately	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					

Paranoia Checklist-Frequency Subscale (Freeman et al., 2005)

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 how often you have this experience.

I sometimes get the thought that:

	Rarely	Once a month	Once a week	Several times a	At least once a
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					

Paranoia and Depression Scale (PDS; Bodner & Mikulincer, 1998)

Please answer each question below by ticking the box that corresponds to how much you agree each statement describes your thoughts and feelings right now.

	Not at all	A little	More than a	Quite a	Frequentl	Very often
I believe that my behaviour is being analysed						
I feel that people talk about me.						
I feel that people are hostile to me.						
I feel that others are picking on me.						
I feel that others are examining my actions.						
I feel that others influence my performance.						

DASS-21(Lovibond & Lovibond, 1996)

Please read each statement and circle a number 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.

The rating scale is as follows:

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

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3

18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991)

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

	Almost never	Sometimes	Often	Almost always
think about how alone you feel				
think "I won't be able to do my job if I don't snap out of this"				
think about your feelings of fatigue and achiness				
think about how hard it is to concentrate				
think "What am I doing to deserve this?"				
think about how passive and unmotivated you feel.				
analyse recent events to try to understand why you are depressed				
think about how you don't seem to feel anything anymore				
think "Why can't I get going?"				
think "Why do I always react this way?"				
go away by yourself and think about why you feel this way				
write down what you are thinking about and analyze it				
think about a recent situation, wishing it had gone better				
think "I won't be able to concentrate if I keep feeling this way."				
think "Why do I have problems other people don't have?"				
think "Why can't I handle things better?"				
think about how sad you feel.				
think about all your shortcomings, failings, faults, mistakes				
think about how you don't feel up to doing anything				
analyse your personality to try to understand why you are depressed				

go someplace alone to think about your feelings				
think about how angry you are with yourself				

The Perseverative Thinking Questionnaire (PTQ; Ehring et al., 2011)

In this questionnaire, you will be asked to describe how you typically think about negative experiences or problems. Please read the following statements and rate the extent to which they apply to you when you think about negative experiences or problems.

	Never	Rarely	Sometimes	Often	Almost always
The same thoughts keep going through my mind again and again					
Thoughts intrude into my mind					
I can't stop dwelling on them					
I think about many problems without solving any of them					
I can't do anything else while thinking about my problems					
My thoughts repeat themselves					
Thoughts come to my mind without me wanting them to.					
I get stuck on certain issues and can't move on					
I keep asking myself questions without finding an answer					
My thoughts prevent me from focusing on other things					
I keep thinking about the same issue all the time					
Thoughts just pop into my mind					
I feel driven to continue dwelling on the same issue					
My thoughts are not much help to me					
I feel driven to continue dwelling on the same issue					
My thoughts are not much help to me					
My thoughts take up all my attention					

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990).

Rate each of the following statements on a scale of 1 ("not at all typical of me") to 5 ("very typical of me").

	1	2	3	4	5
If I do not have enough time to do everything, I do not worry about it.					
My worries overwhelm me.					
I do not tend to worry about things.					
Many situations make me worry.					
I know I should not worry about things, but I just cannot help it.					
When I am under pressure I worry a lot.					
I am always worrying about something.					
I find it easy to dismiss worrisome thoughts.					
As soon as I finish one task, I start to worry about everything else I have to do.					
I never worry about anything.					
When there is nothing more I can do about a concern, I do not worry about it anymore.					
I have been a worrier all my life.					
I notice that I have been worrying about things.					
Once I start worrying, I cannot stop.					
I worry all the time.					
I worry about projects until they are all done.					

Self-knowledge organisation sorting task (Showers, 1992)

In this task, you will use 40 words to generate a description of yourself (the list of words are provided below). Each word contains the name of a trait or characteristic.

Your task is to think of the different aspects of yourself or your life and then form groups of traits that go together, where each group of traits describes an aspect of yourself or your life. In other words, you will think about the aspects of yourself and sort the words into groups so that each group of traits represents a different aspect of yourself. Use whatever groups best describe the way you think about the different aspects of yourself or your life (e.g. roles and identities you have in your life).

You may form as many or as few groups of words as you wish. Continue forming groups until you feel that you have formed the important ones. We realise that this task could be endless, but we want only groups of traits that are currently meaningful to you. When you feel you are straining to form more groups, it is probably a good time to stop.

Each group may contain as few or as many words as you wish. You do not have to use every word; only those that you feel can be used to describe yourself. Also, each word may be used in more than one group, so you may keep re-using traits in different groups as many times as you like.

Please use the text boxes that follow to write the groups and the words that go with it. Please write a label for each group that you create and then list the traits that correspond to each group. Notice that each word contains a number. When listing traits for each group, write only the number of the word not the word itself (use commas to separate the numbers).

List of traits

1. Successful
2. Disagreeing
3. Giving
4. Hopeless
5. Capable
6. Confident
7. Lazy
8. Self-centered
9. Unloved
10. Comfortable
11. Independent
12. Not the “real me”
13. Needed
14. Immature
15. Communicative
16. Weary
17. Mature
18. Uncomfortable
19. Sad & Blue
20. Incompetent
21. Organized
22. Insecure
23. Worthless
24. Inferior
25. Intelligent
26. Lovable
27. Fun & Entertaining
28. Interested
29. Outgoing
30. Energetic
31. Irritable
32. Like a failure
33. Hardworking
34. Isolated
35. Happy
36. Indecisive
37. Friendly
38. Disorganized
39. Optimistic
40. Tense

Appendix 4: Information Sheet

Department of Psychology

Royal Holloway, University of London, Egham, Surrey TW20 0EX, UK

Information Sheet

The impact of two mindfulness meditations on mental wellbeing

Our names are Anna Pinto and Charlotte Snape and we are trainee clinical psychologists at Royal Holloway, University of London. We are carrying out a study comparing the impact of two types of mindfulness meditations on mental wellbeing. The study is supervised by Dr Lyn Ellett (Senior Lecturer of Clinical Psychology) and Dr Jane Vosper (Lecturer of Clinical Psychology).

What Is The Purpose Of The Study?

There is growing evidence that mindfulness is an effective psychological intervention for many psychological problems. Mindfulness means paying attention in a particular way; on purpose, in the present moment and non-judgementally. Mindfulness meditation is the practice of turning your attention to a single point of reference such as breathing. We want to find out if two different types of mindfulness meditations are equally effective in terms of improving mental wellbeing.

Why Have I Been Asked To Take Part?

We are looking for adults (aged above 18) who live in the UK. We wish to study around 100 participants in total.

What Will The Study Involve?

The study involves two phases:

Phase one

If you would like to take part, we will ask you to complete one online questionnaire lasting approximately 10 minutes. The questions are about your feelings and thoughts. Depending on your answers on the online questionnaire you may or may not be eligible to take part in the second phase of the study. If you are eligible, we will contact you to ask if you are interested in participating in phase two.

Phase two

If you would like to take part in phase two, you will be invited to meet one of us either over Skype or at the RHUL Clinical Psychology Department (Bowyer Building, Egham, TW20 0EX, UK) for approximately 1 hour. You will be asked to complete a new set of questionnaires which also include questions about your feelings and thoughts.

Following the completion of the questionnaires, you will be allocated to practise either meditation 1 or meditation 2. The allocation is on the basis of chance, so you have a 50/50 percent chance of practising meditation 1, and a 50/50 percent chance of practising meditation 2.

What will happen if you are allocated to practise meditation 1?

You will be given an audio file including meditation 1. Meditation 1 lasts 10 minutes. You will be required to listen to and practice meditation 1 once per day for two weeks. You will also be required to keep a daily diary of whether you practised meditation 1.

After the end of the two weeks you will be invited to meet one of us either over Skype or, if you prefer, at the RHUL Clinical Psychology Department (Bowyer Building, Egham, TW20 0EX, UK) for approximately 1 hour. You will be asked to complete the same set of questionnaires that you completed before your allocation to meditation 1.

You will be invited for a final meeting over Skype or at the RHUL Clinical Psychology Department (Bowyer Building, Egham, TW20 0EX, UK) one month after the end of the two weeks of practising meditation 1. You will be asked to complete the same set of questionnaires that you completed before your allocation to meditation 1. Following completion of the questionnaires we will answer any outstanding questions you may have.

What will happen if you are allocated to practise meditation 2?

You will be given an audio file including meditation 2. Meditation 2 also lasts 10 minutes. The rest of the steps are the same as with meditation 1.

Will I receive any compensation?

Compensation for phase 1

Once you have completed phase one of the study, you will be entered into a prize draw for a £50 Amazon voucher as compensation for your participation in this study.

Compensation for phase 2

If you are eligible for phase 2 of the study and once you have completed it, you will be entered into a second prize draw for a £50 Amazon voucher.

Who Will See My Information?

Your responses will be seen only by the researchers, Anna Pinto and Charlotte Snape. Other members of the study team (such as supervisors) will only know you by a number. Everything you report is confidential unless you tell us something that indicates that you or someone else is at risk of harm. We would discuss this with you before telling anyone else.

You can decide not to answer some questions if you wish. The study will be written up as part of Anna Pinto's and Charlotte Snape's doctoral theses. It will also be written up and published in a scientific journal, and may be presented in scientific conferences. Your information will not be identifiable when written up, published or presented. Data from this study will be retained for 10 years and subsequently disposed of securely.

Do I Have To Take Part?

You do not have to take part in this study if you don't want to. If you decide to take part you may withdraw at any time without having to give a reason. Taking part, or choosing not to take part in this study, will not affect you in any way now or in the future.

What Should I Do If I Would Like To Find Out More?

If you would like to find out more about any aspect of this study, please contact the researchers who will do their best to answer your questions. Please email anna.pinto.2014@live.rhul.ac.uk or charlotte.snape.2014@live.rhul.ac.uk.

Will the study impact on my wellbeing?

We do not anticipate any negative impact of the study on your wellbeing. However, if at any stage of your participation in this study, you have any concerns about your wellbeing, please stop the study and contact the Samaritans (08457 90 90 90), mental health charity MIND (0300 123 3393), and/or your GP.

Please keep this information sheet for your own reference. Please feel free to ask any questions before you complete the consent form that follows.

The study has been reviewed and approved by the Research Ethics Committee at Royal Holloway, University of London.

Appendix 5: Consent Form

The impact of two mindfulness meditations on mental wellbeing

You have been asked to participate in a study about the impact of two mindfulness meditations on mental wellbeing, which is being carried out by Anna Pinto and Charlotte Snape.

Have you (please circle yes or no):

- Read and understood the information sheet about the study, had an opportunity to ask questions, and have had these answered satisfactorily? yes no

- Understood that you're free to withdraw from the study at any time, without giving a reason and

  without any repercussions? yes no

- Do you agree to take part in the study? yes no

- Do you agree to be contacted after phase 1 if you are eligible for phase 2? yes no

Name in block letters _____

Signature_____ Date _____

Appendix 6: Debrief Form

Department of Psychology
Royal Holloway, University of London
Egham, Surrey TW20 0EX
www.royalholloway.ac.uk/psychology

+44 (0) 1784 443526
Psy-enquries@rhul.ac.uk

The impact of two mindfulness meditations on mental wellbeing

Thank you for your participation in this study.

Please find below a summary of the background and aims of the study. To ensure that the following information did not alter your behaviour whilst participating in the study, the aims of the study were not made explicit to you prior to data collection.

Background of the study

In this study we were interested in comparing the effectiveness of two different types of mindfulness meditations on suspicious and 'paranoia-like' thoughts. We were also interested in its effects on other factors associated with mental wellbeing such as worry and rumination, forgiveness, loneliness and knowledge about one's self. Previous research suggests that mindfulness is an intervention that is effective in reducing the frequency and impact of suspicious and 'paranoia-like' thoughts on wellbeing. However, there is a lack of research on the comparative impact of different types of mindfulness meditations on suspicious and 'paranoia-like' thoughts and wellbeing.

Aims of the study

The main aim of the study was to find out if two different mindfulness meditations (i.e. insight meditation and loving kindness meditation) are equally effective in reducing the frequency and impact of suspicious and 'paranoia-like' thoughts on mental wellbeing. "Insight meditation" involves observation and acceptance of one's thoughts and feelings while maintaining a focus on breathing, whereas "Loving Kindness Meditation" involves increasing one's kindness toward the self and others.

Because it is very important that participants do not know the above information before participation, we please ask that you do not share this information with any other participants.

Your participation

If you were invited to take part in phase 2 of the study that means that you met a certain threshold on questionnaire measures of suspicious and 'paranoia-like' thoughts that you completed in phase 1. Research suggests that such thoughts are common in the general population and occur in everyday life. The threshold used was low and not suggestive of the presence of any mental health difficulties. Reference to suspicious and 'paranoia-like' beliefs does not imply these beliefs to be incorrect.

The potential impact of participation

We do not anticipate any adverse effects from taking part in this study, as research suggests that mindfulness is beneficial for mental wellbeing. However, some people may find that focusing on internal experiences may affect their mood. If this study had had a lasting effect on your mood or if you have any concerns about your wellbeing having taken part, please contact mental health charity MIND (0300 123 3393), the Samaritans (08457 90 90 90), and/ or your GP.

If you have any questions about this study or you would like to have a copy of the results, please contact us at charlotte.snape.2014@rhul.ac.uk, anna.pinto.2014@rhul.live.ac.uk or jane.vosper@rhul.ac.uk. We'd like to remind you that your participation in this study was voluntary and you have the right to withdraw permission for data to be used.

Thank you again for your participation in our study.

Appendix 7: Mindfulness Practice Diary

Please indicate in the table below if you listened to your mindfulness audio file for each day of your participation in the study.

Days	**Did you listen to the mindfulness audio? (Yes or No) Please provide date**	**If yes, at what time?**
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
Day 8		
Day 9		
Day 10		
Day 11		
Day 12		
Day 13		
Day 14		

Appendix 8: RHUL Ethics Committee Approval Notifications

RE: result of your application to the Research Ethics Committee

Ethics <Ethics@rhul.ac.uk>

Fri 19/08/2016 14:23

To: Pinto, Anna (2014) <Anna.Pinto.2014@live.rhul.ac.uk>; Snape, Charlotte (2014) <Charlotte.Snape.2014@live.rhul.ac.uk>;

Cc: Vosper, Jane <Jane.Vosper@rhul.ac.uk>;

Dear All

I'm please to inform you that the Chair has approved the amendments to your project so you may proceed with the changes.

Best wishes
Lucy

Lucy Caton
Research Ethics Committee Secretary
ethics@rhul.ac.uk

From: Pinto, Anna (2014) [mailto:Anna.Pinto.2014@live.rhul.ac.uk]
Sent: 16 June 2016 17:47
To: Ethics <Ethics@rhul.ac.uk>
Cc: Snape, Charlotte (2014) <Charlotte.Snape.2014@live.rhul.ac.uk>; Vosper, Jane <Jane.Vosper@rhul.ac.uk>
Subject: Fw: result of your application to the Research Ethics Committee

Dear Ethics Committee,

We would like to submit some amendments to our approved project (see below).

Please find attached a summary of the proposed amendments, and the steps we will take to manage any potential risks. Please find also attached a slightly amended information sheet (version 2.0).

If you require any further information please let us know. We look forward to hearing from you.

Best wishes,
Anna & Charlotte

---------- Forwarded message ----------
From: **"Ethics Application System"** <ethics@rhul.ac.uk>
Date: Fri, May 20, 2016 at 3:26 AM -0700
Subject: result of your application to the Research Ethics Committee
To: "Snape, Charlotte (2014)" <Charlotte.Snape.2014@live.rhul.ac.uk>, "Vosper, Jane" <Jane.Vosper@rhul.ac.uk>, "ethics@rhul.ac.uk" <ethics@rhul.ac.uk>

PI: Jane Vosper
Project title: A randomised comparative study of Insight and Loving-kindness meditation on non-clinical paranoia

REC ProjectID: 99

Your application has been approved by the Research Ethics Committee.
Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee ethics@rhul.ac.uk