

**A convergent parallel mixed methods investigation into
the role of mindfulness in moderate to severe, persistent
depression**

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Abstract

Introduction

The construct of mindfulness, a non-judgemental awareness of present moment experience, has been increasingly recognised in recent years as being positively associated with psychological wellbeing. In light of accumulating evidence pointing to an inverse relationship between mindfulness and a wide range of psychological distress outcomes, including depression, mindfulness has been increasingly incorporated into modern psychotherapies and healthcare services, and the importance of psychometrically quantifying the construct of mindfulness has become paramount. One of the most reliable and valid instruments developed for the assessment of different aspects of dispositional mindfulness is the Five Facets Mindfulness Questionnaire (FFMQ; Baer et al., 2006), which measures the dimensions of 'Nonreact', 'Observe', 'Actaware', 'Describe' and 'Nonjudge'. However, the psychometric properties of the FFMQ are yet to be tested in clinically depressed individuals with substantial levels of persistent depression. Moreover, there has been no attempt to date to qualitatively explore the experience of mindfulness in those naïve to mindfulness training in order to further determine its role in the management of depressive symptomatology.

Methods

Using a convergent parallel mixed methods design, the present study investigated the psychometric properties of the FFMQ in a sample of 187

adults with moderate to severe, persistent depression recruited from a large National Institute for Health Research funded randomised controlled trial (Morriss et al., 2010). Internal consistency and test retest reliability (at six months) were assessed and construct validity was examined with confirmatory factor analyses (CFA) and by statistically correlating the FFMQ to measures of depression, and mindfulness-related constructs; self-compassion, rumination and experiential avoidance. In addition, using semi-structured interviews, a subset of 20 participants were interviewed to explore their experience of depression and perceived associated changes in dispositional mindfulness. Interview data were analysed using qualitative thematic analysis

Results

Results of psychometric testing supported the internal consistency and test-retest reliability of the FFMQ. CFA indicated that both a correlated and hierarchical model fit the data acceptably, with results slightly favouring the correlated model. Contrary to predictions however, CFA showed that the facet 'Nonjudge' did not load onto an overarching factor of mindfulness. 'Nonjudge' was further found to show a non-significant correlation with depression and only a weak correlation with experiential avoidance and rumination. Thematic analysis of the qualitative data indicated that participants' ability to retain a non-judgmental awareness of present moment experience deteriorates with the onset of depressed mood. This seemed to occur automatically and deliberately as a strategy to avoid contact with painful internal and external experiences, hence

indicating a self-inflicted process of awareness restriction that appears to be a contributing factor to the maintenance of depression

Conclusions

Contrary to what has been previously understood, albeit with different populations, the factor structure of the FFMQ alters in the face of moderate to severe, persistent depression, with the facet 'Nonjudge' no longer forming a component of this construct. Therefore, a four factor model (excluding Nonjudge) is proposed for use in this population. The qualitative data has provided possible explanations for the idiosyncratic behaviour of the facet Nonjudge in people experiencing moderate to severe, persistent depression. Both data sets converge to confirm an inverse relationship between mindfulness and depression. Moreover, the qualitative data suggests that deliberate efforts to restrict facets of mindfulness represents a conscious attempt to manage negative experiences that paradoxically maintains and aggravates depression. Future research following-up participants with substantial levels of depression into remission may shed further light on the role of mindfulness in moderate to severe, persistent depression

Publications

Morriss, R., Marttunen, S., Garland, A., Nixon, N., McDonald, R., Sweeney, T., Flambert, H., Fox, R., Kaylor-Hughes, C., James, M., & Yang, M. (2010). Randomised Controlled trial of the clinical and cost effectiveness of a specialist team for managing refractory unipolar depressive disorder.

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Associated Training

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Table of Contents

Abstract	i
Publications	iv
Presentations.....	iv
Associated Training	v
Acknowledgements.....	vi
Chapter 1	1
Introduction	1
1.1 Significance of the study	1
1.2 Structure of the thesis	2
Chapter 2	8
Literature Review	8
2.1 Prevalence and incidence of mental health problems	8
2.2 Depression	9
2.2.1 Recurrent, chronic and treatment-resistant depression	12
2.3 Theories and treatments for depression.....	14
2.3.1 <i>The Beckian Cognitive Model</i>	21
2.3.2. <i>Interacting Cognitive Subsystems</i>	24
2.4 Mindfulness and depression	32
2.4.1 Origins of mindfulness	32
2.4.2 Contemporary definitions of mindfulness	37
2.4.3 Introduction of mindfulness into clinical settings.....	41
2.4.4 Mindfulness as a treatment for depression.....	45
2.4.4.1 <i>MBCT for depression</i>	47
2.4.5 Rumination, experiential avoidance, self-compassion and their link to mindfulness and depression	50
2.4.5.1 <i>Rumination</i>	50
2.4.5.2 <i>Experiential avoidance</i>	54
2.4.5.3 <i>Self-Compassion</i>	57

2.4.6. Qualitative research exploring mindfulness in depression	62
2.4.7 Difficulties and complications in defining mindfulness	68
2.4.8 Quantifying Mindfulness: self-report questionnaires	70
2.4.9 Five Facets Mindfulness Questionnaire	84
2.5 Psychometric properties of the FFMQ.....	93
2.5.1 <i>The FFMQ and a measure of depressive symptomatology with non-depressed samples</i>	98
2.5.2 <i>Mindfulness and depressive symptoms in participants with depressive symptoms secondary to another health problem</i>	137
2.5.3 <i>Mindfulness and depressive symptoms in participants experiencing current or historic major depressive disorder</i>	169
2.5.4 <i>The psychometric properties of the FFMQ in non-clinical samples</i>	184
2.5.5 <i>The psychometric properties of the FFMQ in clinical samples</i>	203
2.6 Discussion of literature review findings	212
2.6.1 Concluding comments	217
2.7 Rationale for the present study	218
2.8 Study aims.....	219
2.8.1 Objective 1.....	219
2.8.1.1 <i>Research questions</i>	220
2.8.2 Objective 2.....	222
2.8.2.1 <i>Research question</i>	222
Chapter 3.....	223
Methods	223
3.1 Introduction.....	223
3.2 Research methods.....	223
3.2.1 <i>Background</i>	223
3.2.2 <i>Mixed methods research</i>	226
3.3 Ontology and epistemology underpinning the methods used in this study..	232
3.4 Context of the study	237
3.5 Study design.....	238
3.5.1 Principles underlying reliability and validity testing	241

3.6 Quantitative approach: Investigating the psychometric properties of the FFMQ	245
3.6.1 Sample and inclusion/exclusion criteria.....	245
3.6.2 Sample and recruitment.....	248
3.6.3 Ethical considerations	251
3.6.4 Data management	251
3.6.5 Informed consent	252
3.6.6 Ethical approval	253
3.6.7 Measures.....	253
3.6.7.1 <i>The Structured Clinical Interview for DSM-IV Diagnosis for axis 1 disorders (SCID)</i>	253
3.6.7.2 <i>Hamilton Rating Scale for Depression (HAM-D)</i>	254
3.6.7.3 <i>Five Facets Mindfulness Questionnaire (FFMQ)</i>	255
3.6.7.4 <i>Self-Compassion Scale (SCS) “How I typically act towards myself in difficult times”</i>	256
3.6.7.5 <i>Acceptance and Action Questionnaire (AAQ)</i>	257
3.6.7.6 <i>Ruminative Responses Scale (RRS)</i>	258
3.6.7.7 <i>Beck Depression Inventory 1 (BDI)</i>	259
3.6.8 Data collection	260
3.6.9 Data analysis	261
3.6.9.1 Data preparation and preliminary analyses	262
3.6.9.2 Reliability testing	262
3.6.9.3 Confirmatory Factor Analysis – testing the factor structure	263
3.6.9.4 Criterion related validity: Correlations between FFMQ and related constructs	266
3.6.9.5 t-test: FFMQ responses of two samples.....	266
3.6.10 Quantitative approach: Summary.....	267
3.7 Qualitative approach: Exploration of the role of mindfulness in moderate-severe depression	267
3.7.1 Sample and inclusion/exclusion criteria.....	267
3.7.2 Recruitment	269

3.7.3 Data collection	270
3.7.4 Data analysis	273
3.7.5 Qualitative approach: Summary	280
3.7.6 Method chapter: Summary	280
Chapter 4.....	281
Results	281
Introduction.....	281
4.1 Exploring the FFMQ: Results of psychometric testing with depressed and non-depressed samples	281
4.1.2 Participant characteristics	281
4.1.3 Preliminary analyses: Mindfulness and depression	284
4.1.4 FFMQ Reliability: Internal consistency and split half reliability	286
4.1.5 FFMQ Reliability: Test retest.....	289
4.1.6 FFMQ Construct validity: Confirmatory Factor Analysis	289
4.1.8 Post CFA investigation of the FFMQ: the 4FMQ	296
4.1.7 Comparison of FFMQ scoring between samples.....	298
4.1.8. Criterion related validity: preliminary analyses of RRS, SCS & AAQ	298
4.1.9 Criterion related validity: FFMQ and other variables – convergent and discriminant correlations	301
4.1.10 Results: Summary.....	306
4.2 Exploration of the role of mindfulness in moderate-severe depression: Qualitative findings.....	307
4.2.1 Introduction.....	307
4.2.3 Interviewee characteristics.....	307
4.2.4 Themes and Sub-themes.....	310
4.2.4.1 Main Theme: Withdraw	313
4.2.4.2 Sub-theme: Behavioural Withdrawal	313
4.2.4.3 Sub-theme: Reduced Awareness.....	316
4.2.4.4 Sub-theme: Deliberate Reduction in Awareness	320
4.2.4.5 Main Theme: Thinking changes	322
4.2.4.6 Sub-theme: Ruminating, Worrying and Relentless Thinking.....	323

4.2.4.7 Sub-theme: Preoccupation with one’s thoughts precludes awareness of everything else	326
4.2.4.8 Sub-theme: Changes in Cognitive Performance.....	327
4.2.4.9 Main Theme: Self-dislike/Self-criticism.....	330
4.2.4.10 Summary	333
Chapter 5.....	334
Discussion	334
5.1 Introduction.....	334
5.2 Purpose of the research.....	334
5.3 Overview of findings.....	335
5.3.1 Psychometric testing of the FFMQ	335
5.3.2 Qualitative exploration of mindfulness in depression.....	336
5.4 Discussion of findings	336
5.4.1 Internal consistency	336
5.4.2 Test retest reliability	337
5.4.3 Levels of mindfulness in relation to moderate to severe, persistent depression	338
5.4.4 Construct validity of mindfulness in moderate to severe, persistent depression as indexed by the FFMQ	347
5.4.4.1 <i>The facets Observe and Nonjudge in moderate to severe, persistent depression</i>	347
5.4.4.2 <i>Levels of experiential avoidance, rumination and self-compassion in moderate to severe, persistent depression</i>	351
5.4.4.3 <i>Correlations between the FFMQ and depression</i>	353
5.4.4.4 <i>Correlations between the FFMQ, AAQ, SCS & RRS</i>	354
5.4.5 The facet Nonjudge and its idiosyncratic role in moderate to severe, persistent depression.....	357
5.4.6 Suppression of mindfulness: Exploring its role in moderate to severe, persistent depression.....	366
5.4.7 The role of facets of mindfulness in moderate to severe, persistent depression	373
5.5 Significance, strengths and limitations of the study	378

5.6 Implications of the study	385
5.6.1 Implications for the treatment of moderate to severe, persistent depression using mindfulness-based approaches.....	385
5.6.2 Implications for future research into the role of mindfulness in moderate to severe, persistent depression	389
5.7 Conclusion.....	391
References.....	393
Appendices.....	498
Appendix 1.....	498
Appendix 2.....	509
Appendix 3.....	512
Appendix 4.....	514
Appendix 5.....	517
Appendix 6.....	519
Appendix 7.....	521
Appendix 8.....	525
Appendix 10.....	538
Appendix 11.....	553
Appendix 12.....	566
Appendix 13.....	568
Appendix 14.....	574
Appendix 15.....	575
Appendix 16.....	577

List of Figures

Figure 1. Depressive Interlock	27
Figure 2. Convergent Parallel Design.....	230
Figure 3. Critical Realism: three layers of reality	234
Figure 4. Convergent parallel mixed methods design.....	239
Figure 5. Flow of participants in quantitative and qualitative approaches	250
Figure 6. FFMQ Total score: Distribution curve for the depressed sample	286
Figure 7. The hierarchical model of mindfulness	292
Figure 8. The hierarchical model of mindfulness – Nonjudge removed....	295
Figure 9. Distribution curve of the 4FMQ Total score	297
Figure 10. Map of Themes.....	311

List of Tables

Table 1. Psychosocial and psychological interventions recommended for depressive disorders	18
Table 2. Contemporary definitions of mindfulness.....	40
Table 3. Mindfulness-based approaches	43
Table 4. Summary of mindfulness questionnaires	74
Table 5. FFMQ and predicted correlations	87
Table 6. Studies utilising the FFMQ as a measure of mindfulness.....	97
Table 7. Studies including the FFMQ and a measure of depressive symptomatology with non-depressed samples.....	99
Table 8. Studies exploring mindfulness and depressive symptoms in participants with depressive symptoms secondary to another health problem.....	138
Table 9. Studies exploring mindfulness and depressive symptoms in participants experiencing current or historic major depressive disorder.....	170
Table 10. Studies investigating FFMQ mindfulness and its psychometric properties in non-clinical samples.....	185
Table 11. Studies exploring the psychometric properties of the FFMQ in clinical samples.....	204
Table 12. Mixed Methods Designs	229
Table 13. Qualitative participant characteristics.....	269
Table 14. 6 stages of thematic analysis conducted by the author	278
Table 15. Participant characteristics for two samples: Non-depressed and Depressed	283
Table 16. Cronbach's alpha coefficients for two samples: Non-depressed and Depressed	288
Table 17. CFA results: Depressed sample (n=173)	291
Table 18. CFA results: Nonjudge factor excluded (n=173)	294

Table 19. Correlations between FFMQ and depression	301
Table 20. Correlations between FFMQ and other variables	303
Table 21. Qualitative participant characteristics.....	309
Table 22. Themes and sub-themes: A summary	312
Table 23. FFMQ scoring in participants with meditation experience	340

Chapter 1

Introduction

1.1 Significance of the study

Depression is the most common mental health problem worldwide, affecting an estimated 350 million people (World Health Organisation: WHO, 2012). Treatments have been developed throughout the past century to treat this growing and potentially life-threatening problem with significant success. These have included medical, psychosocial and psychological treatments. However, many people experience recurrent episodes or a chronic form of depression (Warden et al., 2006). Of the psychological interventions for depression, CBT is the most commonly accessed by people in the UK, and a particular form of this incorporating mindfulness as a core component, mindfulness-based cognitive therapy (MBCT), has recently been developed to specifically target recurrent depression (Segal et al., 2013). Mindfulness has consequently become a target of treatments for depression and the need for reliable and validated measures capturing this construct has been identified (Brown & Ryan, 2004). Whilst several mindfulness questionnaires exist, arguably the most comprehensive of these is the Five Facets Mindfulness Questionnaire (FFMQ: Baer et al., 2006). The FFMQ is one of the most commonly used measures of mindfulness, and has been utilised with a variety of populations, such as students, those with meditation experience and people undergoing mindfulness training for clinical problems. However, the FFMQ remains untested in samples with

moderate to severe, persistent depression. In addition to quantitative studies of mindfulness employing measures of dispositional mindfulness, such as the FFMQ, several qualitative studies have been conducted to investigate the experience of mindfulness. Qualitative studies of mindfulness to date typically focus on participants' experience of undertaking mindfulness training, exploring changes accompanying engagement in programmes such as mindfulness-based cognitive therapy. There appear to be no qualitative studies exploring the experience of mindfulness and depression in participants who have not completed mindfulness training.

To the best of the author's knowledge, this is the first study examining the psychometric properties of the FFMQ in those with moderate to severe, persistent depression. Internal consistency, test retest reliability (at six months) and the construct validity of the FFMQ were investigated. This study also involved qualitative analysis of participants' descriptions of changes in mindfulness during depressive episodes and appears to be the first to do so in those naïve to mindfulness training.

1.2 Structure of the thesis

Chapter two of this thesis begins with a brief overview of the prevalence and incidence of mental health problems before focusing on depressive disorders, including recurrent, chronic and treatment-resistant forms of these. Biological and psychosocial theories attempting to explain depression are identified and treatments that have been developed to

ameliorate the impact of depression are discussed. In particular, Beck's cognitive theory of depression is outlined and detail of the interacting cognitive subsystems theory provides a theoretical basis for the use of mindfulness in treatments for depression. Chapter two then focuses on the origins, definitions and applications of mindfulness within Buddhist teachings, academic research and clinical contexts. Qualitative explorations of the experience of mindfulness in depression to date are identified and discussed. These studies focus on participants' experience of engaging in mindfulness-training programmes and identifying associated changes in mindfulness and depression-related experiences. The need for psychometrically sound measures of mindfulness is identified and followed by a discussion of potential difficulties in attempts to define this construct. Currently available measures of dispositional mindfulness are identified and the development of the FFMQ is outlined. A review of available literature focusing on the use of the FFMQ alongside measurement of depressive symptomatology highlights that this measure is untested in those with moderate to severe, persistent depression. The chapter concludes with the research questions underpinning this thesis.

Chapter three outlines the research methodology and methods utilised in this study to address the research questions identified. Background to quantitative and qualitative methods is provided and includes a section focusing on the combination of these approaches in mixed methods research. The study design is identified as convergent parallel and an

overview of steps involved in this is given. Critical realism is discussed as an appropriate philosophical foundation for a mixed methods study of this nature. The final sections of chapter three provide details of the study context and steps undertaken in reliability and validity testing of the FFMQ and the qualitative approach, including information about samples, inclusion criteria, recruitment and consent procedures, measures, data collection and data analyses.

Chapter four includes the results of the quantitative and qualitative approaches of the study. Information is given of preliminary analyses, descriptive statistics, internal consistency and test retest reliability. Results are then provided of investigations of construct validity involving confirmatory factor analyses (CFA) and examination of correlational patterns between the FFMQ and depression, rumination, experiential avoidance and self-compassion. Results of thematic analysis are presented and a map of themes identified highlighting changes accompanying the onset of depressed mood described by participants.

Study findings are discussed in chapter five. This discussion focuses on quantitative and qualitative findings in relation to relevant prior research. Data sets are synthesised in an attempt to more fully understand the role of mindfulness in moderate to severe, persistent depression. The discussion includes sections addressing unexpected findings relating to Nonjudge and suppression of mindfulness. Chapter five concludes with

consideration of the study's strengths, limitations and implications for future mindfulness-based interventions and research.

Clarification of the author's contributions

In collaboration with research and clinical colleagues the author was involved in the design of the CLAHRC trial through determining the inclusion of psychological interventions and their timings in the treatment arm of the study. Furthermore, at the commencement of the CLAHRC trial the author independently identified suitable self-report measures to test the construct validity of the FFMQ. Measures included the Five Facets Mindfulness Questionnaire (FFMQ), the Acceptance and Action Questionnaire (AAQ), the Rumination Response Scale (RRS) and the Self-Compassion Scale (SCS). These were consequently incorporated into the main data set of the CLAHRC trial in order to be used in this PhD study.

The author was involved in submitting a substantial amendment to the original ethics application for the additions of the qualitative interviews and recruitment and interviews of the non-depressed sample. This included collaborating with the Trial Manager (Catherine Kaylor-Hughes) and a fellow PhD student (AG) to create and submit the 'notice of amendment form' to the Research Ethics Committee (REC) and jointly writing a supporting document identifying changes to the existing CLAHRC study protocol (see appendix 14). Actions therefore included direct involvement in creating and submitting all supporting documentation for ethics approval listed in the REC approval letter (appendix 7). It additionally involved

responding to queries about the necessity of the qualitative study raised by the REC following submission of the substantial amendment (see appendix 15).

Baseline data for the depressed sample (n=187) for the quantitative study was collected by research assistants in the CLAHRC trial. As discussed in detail in later stages of this thesis the study author collected data from a subsample of 20 participants recruited for the qualitative interviews. He further collected data from 19 of the 33 non-depressed sample (the rest were collected by AG).

The author carried out data cleaning in preparation for analyses testing the psychometric properties of the FFMQ. This involved reviewing the paper copies of completed questionnaires (FFMQ; AAQ; SCS; RRS; BDI; HAMD) and checking that data was entered accurately into the initial Excel spreadsheet by research assistants, prior to transferring to SPSS (Version 22) and Mplus (Muthen & Muthen, 2012). However, paper copies of the questionnaires were not obtainable from the Cambridge site (n=28) meaning that accuracy of data entry could not be checked by the author. Consequently, 159 of 187 participant measures were reviewed directly by the author. As discussed later in this thesis, the author addressed missing data by employing the pro rata method of replacing missing values with a mean score for the relevant scale/facet. Items were reverse scored and subscales identified (where relevant) on Excel spreadsheets by the author prior to transferring these into SPSS and

MPLUS. The author conducted statistical analyses autonomously under the guidance of the study statistician. This included carrying out analyses to check the data for normality of distribution and suitability for parametric testing. The author subsequently conducted all further statistical analyses necessary for evaluating reliability and construct validity of the FFMQ, including CFA.

Chapter 2

Literature Review

2.1 Prevalence and incidence of mental health problems

The profound suffering arising from the existence of mental disorders has been reported throughout history. No one is immune to the risk of developing a mental health problem regardless of age, race, or financial status. They affect both sexes and are present amongst all countries and societies (World Health Organisation: WHO, 2012).

Whilst the last century has witnessed significant economic and social advances leading to improvements in physical health, standards of living and increased life expectancy for the world's population, there has been a substantial rise in the number of reported mental health disorders including anxiety disorders, alcoholism, drug abuse, dementia and depression (WHO, 2010). Whilst the extent of such increases may be exaggerated by population growth, changing age structures, increased awareness and non-clinical use of the terms anxiety and depression (Baxter et al., 2014, Wittchen et al., 2011), mental health problems nevertheless constitute a significant burden on individuals and societies affecting an estimated 10% of the world's population at any one point and approximately 25% of people within their lifetime (WHO, 2010). The impact in terms of Disability-Adjusted Life Years (DALYs) is substantial with 7.4% of these arising from mental disorders and substance misuse, which are the leading cause of years lost to disability worldwide

(Whiteford et al., 2013). The economic burden of mental illness is also significant, estimated at \$2.5 trillion annually across the world (WHO, 2014). Despite this prevalence, rates of mental illness are projected to increase in the coming years (WHO, 2012). The single most common mental disorder is depression, which is predicted to overtake other health conditions as a leading cause of ill health (Mathers & Loncar, 2006).

2.2 Depression

Central to a diagnosis of depression is the presence of low mood associated with a lack of enjoyment and interest in usual activities (DSM-IV-TR: American Psychiatric Association, 1994; ICD-10: WHO, 1992). Symptoms also typically include tearfulness, lethargy, social withdrawal, reduced activity, irritability, increased pain, anxiety, reduced libido, disrupted sleep, changes in appetite and loss of weight. These symptoms are usually accompanied by negative cognitive changes including reduced concentration, attention and self-critical thoughts (Cassano & Fava, 2002). These changes may increase feelings of worthlessness and guilt and combined with a sense of hopelessness potentially lead to suicidal thoughts and acts (NICE, 2009). The existence of several symptoms for a two week period or longer constitute a clinical diagnosis of major depressive disorder (MDD). The level of depression diagnosed is determined by the number of symptoms present, their severity and their impact on functioning (NICE, 2009). They have been categorised in National Institute for Health and Clinical

Excellence Guidelines for depression (NICE: 2009, p.24) in the following way:

- Subthreshold depressive symptoms: fewer than five symptoms of depression
- Mild depression: few, if any, symptoms in excess of the five required to make the diagnosis, and the symptoms result in only minor functional impairment
- Moderate depression: symptoms or functional impairment are between 'mild' and 'severe'
- Severe depression: most symptoms, and the symptoms markedly interfere with functioning. Can occur with or without psychotic symptoms

Depression can take many forms (NICE, 2009). For example, seasonal affective disorder (SAD) is characterised by a profound drop in mood during the winter months and reduced daylight hours, with remission occurring during onset of spring. The experience of delusions and/or hallucinations alongside depressed mood may lead to a diagnosis of psychotic depression. Postpartum depression occurs following childbirth, affecting 10-15% of mothers. Bipolar affective disorder involves cycling mood changes between extreme highs (manic episodes) and lows in mood (depressive episodes). For some sufferers physical problems, such as pain, rather than psychological symptoms predominate the person's experience of the illness (Kleinman & Cohen, 2001).

Depression is the most common mental health problem worldwide (WHO, 2014). At any one point around 5% of the world's population will be experiencing an episode of depression, with a further 6% suffering from mixed depression and anxiety (WHO, 2009). The lifetime risk of MDD is 7-12% for men and 20-25% for women (Kessler et al., 2003). Despite such high rates, the prevalence of depression is increasing; it is expected to be a major cause of worldwide disability by 2030 (Mathers & Loncar, 2006) and the number one cause of disease burden in high-income countries (Whiteford et al., 2013). Depression is consequently a significant cause of economic burden with a cost to the UK economy in 2007 estimated as £1.7 billion due to both treatment costs and reduced workforce productivity (NICE, 2009). The cost of depression is partly due to the young age of onset and its tendency to recur. The average age of first onset is mid-twenties (Fava & Kendler, 2000) and at least half of sufferers will experience more than one episode (Kupfer, 1991).

Complete remission between episodes is associated with improved functioning and a reduced risk of future relapse (Kennedy & Foy, 2005). Trials of anti-depressant medications report up to 40% remission for people presenting with MDD (Agency for Health Care Policy and Research, 1993). A recent large scale trial of the treatment of depression was the Sequenced Treatment Alternatives to Relieve Depression trial (STAR*D), carried out in the USA and involving over 4000 participants. This found that approximately 50% of people with depression remit following treatments within a 6-7 month period and that this can rise to

68% if treatment options are systematically delivered up to 12 months (Rush et al., 2006). However, people with more severe and enduring depression are less likely to be early responders to treatment (Whiteford et al., 2013), may relapse soon after remission or fail to achieve relief from symptoms at all (Warden et al., 2006). Chronic, relapsing and treatment-resistant depression therefore needs particular consideration and is likely to require a longer-term approach to treatment.

2.2.1 Recurrent, chronic and treatment-resistant depression

Despite many people with depression remitting either spontaneously or following healthcare interventions, a significant proportion fail to achieve remission. Previously conceptualised as an episodic illness, depression is now regarded primarily as a chronic and relapsing condition (Ustun & Chatterji, 2001). Incomplete recovery is common with up to half of sufferers still meeting criteria for diagnosis one year after onset due to high relapse rates (Greden et al., 2001), and some individuals experience a pattern of depression characterised by recurrent and frequent episodes, occurring with no clear trigger. At least 50% of people have two or more episodes during their lifetime and the more relapses experienced, the greater the risk of future episodes – by the third episode the risk has risen to 90% (Kupfer, 1991). Such a course of depression is likely to lead to increased social difficulties and possible changes at a neurobiological level, and may be associated with poorer outcomes (Greden, 2001). A further 10-20% of people with depression

will fail to respond adequately to treatment and experience a chronic and persistent depression lasting several years (NICE, 2009).

Chronic depression relates to a period of depression exceeding two years, irrespective of whether or not treatment has been attempted (NICE, 2004; Bschor et al., 2014). Treatment resistant depression (TRD) has been described as a subset of chronic depression (McPherson et al., 2005) which, in addition to lasting a minimum of 2 years also fails to respond to at least two courses of antidepressant medication, given at an adequate dose for a sufficient period (Berlim & Turecki, 2007a, Sourey et al., 1999, Bschor et al., 2014, Mcpherson et al., 2006). However, there is a lack of consensus of what precisely constitutes difficult to treat depression (Berlim & Turecki, 2007b; McPherson et al., 2005) and the term can be regarded as a stigmatising and imprecise label for a complex and multi-faceted problem and is therefore no longer included as a term in key UK health guidelines (NICE, 2009). Whilst it is not included in any diagnostic classification manuals it can nevertheless be seen as a useful form of 'short-hand' for describing this problem (NICE, 2009) and remains in use (Bschor et al., 2014; McPherson et al., 2013).

TRD is considered more burdensome than other forms of depression and is associated with high levels of physical and psychiatric co-morbidity and intensive use of psychiatric services (Greden, 2001). People can therefore present with multiple problems including social, physical and psychological difficulties (McPherson et al., 2013) and it

may prove particularly difficult to effectively treat in the long term (McPherson et al., 2005). This is reflected in findings from the STAR*D trial (Rush et al., 2006) which found that participants needing more treatment levels were characterised by more severe symptoms and greater psychiatric and general medical co-morbidities at commencement of the study. However, findings from this also indicate that a systematic and responsive approach to delivering treatment regimens is likely to yield improved results. Other recent trials demonstrate some success in treating participants whose depression does not respond to first line treatments including cognitive behavioural therapy (Wiles et al., 2013; Morriss et al., under review) and relapse prevention treatments for recovered individuals which include mindfulness (Teasdale et al., 2000; Kuyken et al., 2008). In spite of this a significant proportion of patients will continue to experience symptoms of depression and effective treatments for this are consequently a priority.

2.3 Theories and treatments for depression

Current explanations for the causes of mental disorders include social factors, psychological explanations, and biological factors or a combination of all these factors.

Biomedical models of depression propose that this is influenced by physiology, with depression occurring as a result of physical pathology such as disturbances of the brain (Drevets et al., 2008), and hormonal changes (Gill, 2007). Studies of families attempting to clarify the

potentially causal role of genes in depression highlight that this typically runs in families (e.g., Oruc et al., 1998) suggesting the existence of a genetic component. Twin studies appear to confirm that the closer the genetic relationship the more likelihood of developing depression (McGuffin et al., 1996). Recent techniques enabling imaging of the brain and other methods have recently begun to clarify the neurobiological abnormalities typically associated with MDD with investigations increasingly focusing on changes in interconnectivity in the prefrontal and limbic structures (Maletic et al., 2007) and the role of the default-mode network during episodes of depression (Sheline et al., 2009). Neurotransmitter disturbance occurring in the synaptic gaps between nerve cells (neurons) in the brain have also been proposed as playing a causal role in depression, though it remains uncertain whether such changes predate depressive onset or are secondary to this (Barkway, 2009). Nevertheless, increases in several types of neurotransmitters (particularly serotonin, norepinephrine and dopamine) have been linked with improved mood (Lemonick, 1999) and form the subsequent basis for antidepressant medications. These have generally been found to be most beneficial for people with moderate to severe depression. Of this group 20% will recover spontaneously, 30% remit with placebo and 50% improve following the introduction of an anti-depressant (Anderson et al., 2008). However, evidence of antidepressant benefits may be based on selective publications favouring predominantly preferential results and consequently overstate their efficaciousness (Goldacre, 2012).

The role of life events in triggering episodes of depression has long been assumed to be a causal factor (Hammen, 1992) and an early study exploring differences between numbers of important life events in the six months prior to the onset of a depressive episode found that participants were three times more likely to report a significant life event compared to those without a history of depression (Paykel et al., 1969). Subsequent studies have also established a link between life events and onset of depression (Brown & Harris, 1978; Bebbington et al., 1981; Costello, 1982; Bebbington et al., 1988), though there is the recognition that this varies depending on the form of the depression, with recurrent depression appearing to require less environmental stress to provoke a relapse (Kendler et al., 2001).

Modern psychological theories seeking to explain the causes of depression began with the work of Sigmund Freud at the end of the 19th and early 20th century focusing on the role of childhood events in the onset of depression (Freud, 1922), through to more recent cognitive and behavioural theories proposing the centrality of thoughts and actions in the onset and maintenance of this (Ellis, 1962; Abramson et al., 1978; Seligman, 1975; Lewinsohn & Gotlib, 1995; Hayes et al., 1999; Beck, 1976). A range of psychosocial and psychological therapies have been developed throughout the past century, aiming to address psychological distress, many of which are identified within NICE guidelines for depression as potentially beneficial for people with depressive disorders (NICE, 2009). These include low-intensity interventions which are

generally recommended for mild-moderate depression and high intensity interventions, more intensive psychological therapies, which are advised for more severe and reoccurring depression. These are summarised in table 1 below.

Table 1. Psychosocial and psychological interventions recommended for depressive disorders

Low intensity psychosocial interventions	Description	Structure
Computerised cognitive behavioural therapy (CCBT)	A form of CBT delivered using a computer either via a CD-ROM, DVD or the internet. The programme content is based on standard cognitive behaviour therapy but designed to be implemented by a patient using computer based technology rather than through therapist delivered therapy.	9 to 12 weeks, including follow-up.
Guided self-help	A self-directed intervention utilising a range of books or other self-help manuals based on an evidence-based intervention with the focus of addressing symptoms of distress. The intervention is supported by a health care worker.	6 to 8 sessions (face-to-face and via telephone) normally taking place over 9 to 12 weeks, including follow-up.
Structured group physical activity programmes	A structured physical activity with a recommended frequency, intensity and duration specifically designed as a treatment for depression. May be delivered either individually or as a group intervention.	3 sessions per week of moderate duration (45 minutes to 1 hour) over 10 to 14 weeks (average 12 weeks).
High-intensity psychological interventions	Description	Structure

Counselling	A talking therapy in which people can explore and identify ways of living with greater resilience and wellbeing. This is facilitated through the development of a therapeutic relationship characterised by empathy, warmth and non-judgement.	6 to 10 sessions over 8 to 12 weeks.
Short term psychodynamic psychotherapy	A non-directive psychological therapy founded on a psychodynamic/psychoanalytic model of understanding emotion and behaviour. The therapeutic relationship is used as a basis for identifying and working through conflicts originating in past experiences, in order to reduce their impact on current interpersonal and life situations.	16 to 20 sessions over 4 to 6 months
Couples therapy	A psychological intervention derived from a model of the interactional processes in relationships which aims to change the nature of problematic interactions so that participants may develop more supportive relationships and reduce associated symptoms of distress.	15 to 20 sessions over 5 to 6 months.
Interpersonal therapy	A psychological intervention focusing on interpersonal issues in which the therapist and patient identify the consequences of interpersonal problems on symptoms of distress. Strategies are developed to cope more effectively with interpersonal problem areas.	16 to 20 sessions over 3 to 4 months.

Behavioural activation	A psychological intervention, derived from the behavioural model of affective disorder in which patient and therapist work jointly to identify the impact of problem behaviours, particularly avoidance, on symptoms of distress. Adaptive behaviours are gradually introduced in order to assist the patient in reversing avoidance and so engage in rewarding and mood enhancing activities.	16 to 20 sessions over 3 to 4 months with 3-4 follow up session over the next 3-6 months.
Cognitive behaviour therapy	A psychological intervention derived from the cognitive behavioural model of affective disorders which attempts to enable patients to recognise the effect of negative thinking and behaviours on problem situations including depressed mood. Patients develop strategies to test the validity of negative thoughts and experiment with alternative viewpoints and associated behaviours.	<p>Group based CBT: based on a structured model such as 'Coping with Depression' and delivered in 10-12 sessions with 8-10 patients, over 12-16 weeks.</p> <p>Individual CBT: 16 to 20 sessions over 3 to 4 months with 3-4 follow up session over the next 3-6 months. Number of sessions may be extended if patient has a history of depressive relapse.</p>

Mindfulness-based cognitive therapy	A group based programme combining mindfulness meditations with cognitive behaviour therapy exercises for depressive relapse prevention. Participants learn to identify and disengage from behaviours likely to lead to depressive relapse.	Delivered in groups of eight to 15 participants with weekly 2-hour meetings over 8 weeks and four follow-up sessions in the 12 months after the end of treatment.

Whilst there are many evidence-based psychosocial and psychological treatment options listed in health guidelines for depression as outlined in the table above, cognitive and behavioural therapies are recommended as psychological treatments of choice for many presentations of depressive disorder, particularly more severe, recurring and difficult to treat forms of this (NICE, 2009). Since their creation and development over the past 60 years they have become the most common form of talking therapy available within the National Health Service in the United Kingdom. CBT for depression is most commonly based on the work of Aaron Beck (NICE, 2009).

2.3.1 The Beckian Cognitive Model

The Beckian Cognitive Model was developed principally in the 1970's as the basis for a new form of psychological therapy for the treatment of mood disorders. Beck's cognitive theory of emotional disorders

emphasises the crucial role that cognitions play in determining how a person feels and acts (Beck, 1976). Critically, Beck's model emphasises the role of the *content* of cognitions and beliefs in triggering and perpetuating problems with mood. The content of such cognitions frequently involves themes of loss, worthlessness and failure (Segal et al., 2013) and are proposed to act as antecedents for depressive episodes. Whilst cognitive theories of depression have provided the conceptual foundation of therapies seeking to alleviate this, studies have failed to support the assertion that cognitions are the primary antecedent for low mood or to identify a negative attributional style as existing prior to the onset of depression – a necessary finding if these were to be identified as a cause of this (Teasdale, 1993; Ingram et al., 1998). Studies have instead found that the content of attitudes and beliefs of people with a history of depression are actually no different to those who have never been depressed, until triggered by a drop in mood. It therefore appears that dysfunctional cognitive structures remain latent until activated by negative mood (Teasdale & Dent, 1987; Miranda & Persons, 1988; Miranda et al., 1990; Roberts & Kassel, 1996). The difficulty in observing latent dysfunctional beliefs and thoughts may in part be explained by the deliberate suppression of these during remission (van der Does et al., 2005). However, as cognitive demands increase with depressive onset it may become harder to suppress negative cognitive material resulting in its emergence into consciousness (Wenzlaff & Bates, 1998). Such an account may explain their apparent inactivity in between episodes of depression (van der Does et al., 2005).

This premise is supported by the Differential Activation Hypothesis (DAH; Teasdale, 1988) which argues that it is at the point at which someone experiences a negative change in mood that they become vulnerable to further depression. It is the individual's initial response to this alteration in affect that is considered pivotal in determining whether depression takes hold or otherwise, rather than the maladaptive content of self-referential thinking. Responses are typically characterised by 'cognitive reactivity' involving high levels of ruminative and worrisome thinking combined with self-defeating efforts to avoid and suppress these which unwittingly serves to maintain and aggravate low mood, rather than improve this as intended (Segal et al., 2013; Wegner, 1994). DAH therefore highlights the potential importance of processes of thinking involving 'cognitive reactivity' rather than solely the content of thoughts as proposed by Beck's cognitive model. A study carried out by Teasdale and colleagues also undermines the role of the primacy of the content of cognitions in depressive relapse by suggesting that the efficacy of cognitive therapy results from its success in assisting reductions in an absolute, dichotomous thinking style, rather than simply through decreasing the negative content of cognitions (Teasdale et al., 2001). They argued that further protection from relapse generated through cognitive therapy may be created by the individual breaking habitual depression-related processing patterns, via distraction for example (Fennell et al., 1987) rather than through altering belief in validity of negative cognitions. These findings challenge the validity of directing therapy to solely modify the content of schemas and cognitions, the traditional prime target of

cognitive therapy, as there is an absence of clear evidence that altering these positively is the exact mechanism by which recovery is achieved and risk of relapse reduced. Indeed there is evidence to suggest that such negative beliefs alter spontaneously as mood improves, regardless of the treatment modality (Simons et al., 1984).

Beck's theory of depression and depressive relapse has been widely debated and researched. The primacy of cognitions and their content has not been borne out by research as constituting the primary cause of this, despite the success of cognitive therapy as an effective treatment for depression and depressive relapse. The Interacting Cognitive Subsystems theory (ICS: Teasdale & Barnard, 1993) attempts to account for these anomalies in traditional cognitive theory.

2.3.2. Interacting Cognitive Subsystems

The Interacting Cognitive Subsystems (ICS) theory has been described as providing a:

“Comprehensive systematic model of the organisation and function of the resources underlying human cognition” (Barnard & Teasdale, 1991, p.1).

Contrary to previous theories of mind that have conceptualised individual and generally discrete systems organising and processing stimuli and information, ICS proposes that emotion is the result of system wide activity. The total system comprises nine subsystems interacting to allow

simultaneous processing of complex and multiple data relating to previous experience and memory. Central to this theory are the Propositional and Implicational subsystems. It is hypothesised that these different systems handle material at different levels of meaning with distinctive emotional consequences. Propositional level meanings signifies thinking *about* things. Meanings at this level are specific and clear and can for example be communicated through words. The Implicational subsystem represents deeper level meanings that may encapsulate a multitude of experiences and includes information from sensory sources, providing a more powerful generic 'felt sense'. When this subsystem is receptive, feelings and sensations are experienced as subjective and immediate events, directly accessed, rather than as items for conceptual thought, as in the Propositional subsystem. Propositional and Implicational subsystems account for the existence of qualitatively distinct types of belief: intellectual and emotional. Importantly, this contrasts with Beck's cognitive theory which proposes that the difference between knowing something intellectually or emotionally is a matter only of degree, rather than the result of a different kind of 'knowing' relating to distinct systems of processing information (Teasdale, 1993).

ICS asserts that the Implicational and Propositional subsystems interact in depressive disorder to form a configuration labelled depressive interlock. This phenomenon drives processing priorities to follow a distinctive pattern consisting of a potentially destructive and reciprocal relationship between these subsystems causing the ongoing

regeneration of multi-layered depressogenic constructs. An example of this is provided below highlighting a fictitious episode of low mood.

Figure 1. Depressive Interlock

Situation

Waking up following night of disrupted sleep. Feel “fed-up”

Implicational Subsystem

Feelings of tiredness,
Sense of physical heaviness



Propositional Subsystem

Negative automatic thought: “*oh no, not again*”



Propositional Subsystem

Ruminative thinking style:
*“I feel terrible, why do I feel like this?
It’s intolerable,
but I’ll always be like this,
I can’t change it, I’ve
always been weak. It’s because
I’m weak that I’m depressed”*



Implicational Subsystem

Feel ‘empty’, alone, worthless,
sense of shame
memories/images of shame experiences



Depression intensifies

As highlighted above, this processing configuration accounts for the absence of external triggers in maintaining low mood (Teasdale & Barnard, 1993). It also indicates how low mood itself may act as a precipitant for further creation of negative schematic models and ongoing depression. This hypothesis contrasts therefore, with Beck's original proposal that cognitions are the primary trigger for low mood. ICS proposes that this process is fundamental to the continuation of depression. Consequently, if this pattern is interrupted, depression will lift. This hypothesis is consistent with results from Fennell and colleagues study into the effect of distraction on mood (Fennell et al., 1987). Through reducing frequency of depressing thoughts the depressive interlock configuration could be disrupted. This study found that the mood of moderately depressed individuals was temporarily improved following distraction tasks (Fennell et al., 1987). However, it is argued that this will only offer temporary respite from low mood because when cognitive resources are no longer engaged in distracting activities, attention is immediately redirected to the process of Propositionally thinking *about* current problems, a phenomenon known as 'cognitive imperialism' (Teasdale, 1997). Whilst this may be aimed at resolving current difficulties by focusing attention on them conceptually, continued attention on the negative content of ruminative thoughts is likely to maintain depression. If such habitual and automatic cognitive routines are to be disrupted access to an alternative 'mind' is needed. Teasdale (1999) outlines 3 'modes of mind' significant in emotional processing, and their potential role in maintaining or disrupting depressive interlock:

- **Mindless Emoting.** The individual is 'at one' with their emotional state.

There is a complete lack of self-awareness and no ability to stand back and evaluate or reflect on this process.

- **Conceptualising/Doing.** In this mode the individual's awareness is preoccupied with thinking *about* things, such as planning future events or focusing on discrepancies between current state and desired goals. Ruminating and alternative cognitive and behavioural strategies to experientially avoid negative thoughts and feelings occurs within this mode of mind. Striving to overcome these through rumination or to avoid all contact with such phenomena is hypothesised to maintain depressive interlock by contributing to increased self-criticism and blame as well as obstructing access to a more helpful mode of mind at this point – mindful experiencing/being.

- **Mindful Experiencing/Being.** In this mode the individual is able to subjectively experience events without responding in an evaluative manner. Feelings, sensations and thoughts are sensed as aspects of subjective experience rather than conceptual thought. It is hypothesised that the process of 'mindful experiencing' may advantageously disrupt the depressive interlock processing configuration. This occurs, for example, during some forms of meditation when thoughts, feelings and sensations are allowed to be fully experienced without the individual then employing the Propositional level of meaning to evaluate and think *about*

them. Instead, allowing individuals to experience these moments 'mindfully' may assist the ability to 'decentre' from depressive thoughts, rather than engage with them automatically as self-evident truths. This may then aid generation of alternative, more positive and helpful schematic models, potentially enabling a heightened capacity for self-compassion (Kuyken et al., 2010; Segal et al., 2013). If a store of alternative, non-depressogenic schematic mental models can be created, these may be accessed in the face of future low mood and thus clinical depression may be avoided. Otherwise, longstanding responses to mild dysphoria may result in the individual getting trapped in the depressive interlock configuration and becoming increasingly distressed.

By switching into the Mindful Experiencing 'mind-in-place' the individual is no longer engaged in a process of continuous evaluative thinking about themselves (Teasdale, 1997). Instead they are able to experience inner events and external stimuli non-judgementally, without immediate analytical reference to themselves. Observing experiences in this way creates a different relationship with thoughts and feelings. These are recognised as psychological events and objects in their own right; thoughts are acknowledged as real themselves, yet recognised as not necessarily reflecting reality. This fundamental shift in perspective is labelled 'meta-cognitive awareness' and is credited with disrupting the depressive interlock by extracting the Propositionally driven 'conceptualising/doing' mode from the processing configuration, enabling

synthesis of alternative, non-depressogenic schematic mental models and recovery of mood (Teasdale, 1999).

In summary, the ICS model proposes that we experience and process emotions within an overarching framework consisting of subsystems. Each of these has a specific role in handling particular types of information and stimuli. Central to its use in understanding mood disorders is the suggestion that processing information within the Propositional subsystem can lead to the person becoming stuck in a thinking style that may perpetuate low mood through thinking *about* things, typically characterised by rumination. It is therefore processes of thinking, rather than the content of cognitions that is central to the understanding of depression and depressive relapse in this cognitive theory. When the Implicational subsystem is receptive however, a wealth of alternative, multi-faceted information can be experienced enabling the creation of new, more positive schematic models. If the person can develop a store of these new non-depressogenic schematic models that can be accessed when triggers for mood disturbance occur, clinical depression may be avoided. It therefore follows from this theory that the risk of depressive relapse may be offset by learning to operate the Implicational subsystem by deliberately inhabiting a state of mindful experiencing/being at times of vulnerability. This requires the cultivation and systematic deployment of a state of heightened awareness – mindfulness.

2.4 Mindfulness and depression

Mindfulness has been defined as:

"Paying attention in a particular way; on purpose, in the present moment, and non-judgmentally to things as they are" (Kabat-Zinn, 1990, p.4).

An innate human capacity, mindfulness has become increasingly utilised as a core component of secular programmes focusing on achieving a state of health and well-being over the past several decades. However, the deliberate use of mindfulness to enhance wellbeing began approximately 2500 years ago when it was incorporated into Buddhist teachings as a key vehicle for the attainment of spiritual enlightenment.

2.4.1 Origins of mindfulness

Mindfulness is a core practice within Buddhist philosophy which teaches that suffering is an integral part of human existence and only increased by attempts to contain it. Living in accordance with Buddhist teachings is intended to directly address this suffering and result in spiritual enlightenment, signified by the end of suffering as all things are seen with total insight and clarity, accompanied by compassion towards the self and all beings (Goldstein, 2002). This arises principally from an increased detachment from urges to fulfil particular desires with a corresponding ability to fully engage with the actuality of moment to moment experience (Kumar, 2002). In this way, the tension between desired and actual states diminishes and suffering is reduced. It is the

act of letting go of things, whether material, conceptual or emotional, which leads to freedom (Goldstein, 2002). Mindfulness facilitates this process.

Mindfulness is commonly referred to as satipatthana from the Pali language in which the early Buddhist texts were written. The word sati refers to 'attention' or 'awareness' that is skilful, or good. This is also referred to as 'mindfulness'. Patthana refers to 'presence of'. Combined, this makes 'presence of skilful attentiveness', or 'presence of mindfulness' (Thera, 1962). It is also referred to as 'insight' or 'Vipassana' meditation. Vipassana is the Pali word for insight, or clear sightedness. It is found in all the Buddhist traditions and is the fundamental practice of paying attention (Goldstein, 2002). Within Buddhism mindful awareness is developed through systematic attentional focus on core components of experience including bodily experience, as outlined in the Satipatthana Sutra:

“When walking the practitioner must be conscious that he is walking, when sitting, that he is sitting... no matter what position the body is in, the practitioner must be conscious of that position” (Soma & Pereira, 1949, p.46).

Mindfulness of the body is regarded as a method for bringing the mind into balance. Through a process of repeatedly bringing awareness to the body or a specific aspect of this, such as the breath, a heightened

concentration and sense of calmness and tranquillity is developed (Goldstein, 2002). The subsequent sense of equanimity and emotional stability enables a fuller exploration of present reality, including observation of thoughts and mental states (Goldstein & Kornfield, 1987). In this way, awareness of physical experience facilitates intimate understanding of the content and workings of the mind, a key feature of the Buddhist route to enlightenment (Goldstein, 2002).

This systematic observation of the mind helps us to notice the tendency to categorise phenomena as pleasant or unpleasant and react accordingly. This can gradually reduce the preoccupation with reacting to avert pain or cling onto pleasure. The act of simply resting in awareness in this way engenders understanding that attempting to endlessly meet preconditions for contentment results only in further dissatisfaction and disappointment (Thera, 1962). Mindfulness provides an opportunity to instead experience events fully and respond skilfully without being swept along by automatic and habitual reactions. It is the heightened awareness arising from mindfulness meditation that allows this to occur (Goldstein & Kornfield, 1987).

As highlighted above, mindfulness is developed through focusing on everyday activities such as breathing, the body, feelings and the mind. Beginning with formal meditation practices and then bringing mindfulness to these activities continuously throughout the day is necessary to generate levels of awareness consistent with the attainment of

enlightenment. This involves awareness of every thought, feeling and sensation that arises without instantly reacting to them but simply acknowledging their existence (Hanh, 1975). This provides an opportunity to then choose how best to respond to these events. Having repeatedly practiced bringing awareness to specific facets of experience, such as the breath, attention is expanded to include any observable phenomena. This meditation technique is called 'choice-less awareness' or 'bare attention' and is regarded as a key form of mindfulness directing individuals towards enlightenment (Thera, 1962). Bare attention is a form of observing internal and external events fully, without reacting (Thera, 2005, Cardaciotto et al., 2008). As described above, such reactions are usually automatic and often characterised by aversion to experience. The exacerbating effects of automatically reacting to suppress or eradicate unwanted internal events are countered by calmly facing and naming such difficulties within the meditation practice. The ability to recognise and step back from such phenomena in this way is a key aim of mindfulness meditation (Thera, 2005). This requires the individual to focus only on the present moment, counteracting the tendency to dwell in the past or fantasise about the future. This is regarded as a pointless waste of energy and potential source of suffering (Thera, 1962). In contrast, mindfulness meditation promotes full contact with the reality of what is actually present, rather than being lost in memories, imaginings and projections about the future. In this way, bare attention encourages objective observation of present moment experience, rather than the more usual filtering phenomena through idiosyncratic and often biased

interpretations with corresponding reactions. An accurate recognition of what is present allows clarification of the constituent parts of experience so that it can be more fully understood and experienced. This reduces the risk of being unwittingly swept into reactions to events that cause unhappiness and distress (Thera, 2005).

Meditation techniques within Buddhism also involve meditations specifically aiming to generate compassion, such as 'loving kindness' meditation or 'metta' where the individual encourages thoughts of compassion towards themselves and others. This involves incorporating words into a meditation practice such as "*May you be free from suffering*" (Goldstein & Kornfield, 1987). Such compassion is considered a necessary component of mindfulness as distractions are managed within this with equanimity and acceptance. Therefore, a compassionate attitude is regarded as a necessary prerequisite for the development of mindfulness, whilst at the same time being a core feature of it (Kumar, 2002).

In summary, mindfulness is conceptualised within Buddhism as a necessary component of the path to spiritual enlightenment. It involves observing internal and external phenomena without reaction in an effort to fully comprehend the true nature of experience. Bare attention tempered with a compassionate attitude is a primary method for achieving this.

2.4.2 Contemporary definitions of mindfulness

Contemporary definitions and operationalisations of mindfulness have accompanied the increased interest in mindfulness as a health intervention in recent decades. Ellen Langer developed a concept of sociocognitive mindfulness (Langer, 2010), a state of awareness characterised by conscious information processing (Carson & Langer, 2006). Whilst this bears resemblance to alternative definitions of mindfulness, Langer's construct focuses on cognitive and intellectual functioning and increasing the individual's ability to recognise the possibilities in each situation. This is theorised to lead to more informed and skilful actions with positive outcomes arising from this (Langer, 1989). This early western construct of mindfulness has similarities with other conceptualisations of this, and is likely to have influenced later definitions (Dryden & Still, 2006), though its primary focus on cognitive elements of mindfulness distinguishes this from other mindfulness constructs (Singh et al., 2008; Brown et al., 2007).

A further conceptualisation of mindfulness is proposed by Leary and Tate (2007) who assert that mindfulness consists of factors including: mindful attention; diminished self-talk; nonjudging and non-doing. They also state that mindfulness exists within a therapeutic and/or spiritual framework. However, this conceptualisation is not supported by any research attempting to validate this definition. An operational definition developed by Bishop and colleagues (Bishop et al., 2004) is regarded as one of the most influential conceptualisations of this construct (Malinowski, 2008).

Within this mindfulness is defined as consisting of two components: self-regulation of attention and open curiosity/acceptance of moment to moment experience. Self-regulation of attention is proposed to assist reductions in elaborative thinking, such as rumination, as well as facilitate development of metacognitive awareness. Awareness characterised by an attitude of open curiosity/acceptance is predicted to lead to improved ability to tolerate negative events including thoughts and feelings and thus reduce experiential avoidance. Whilst the two key features of attention and acceptance appear fundamental to any conceptualisation of mindfulness, there are nevertheless criticisms of this construct. For example, Shaver (2007) identifies an inadequate description of 'non elaborative awareness' believing that this weakens the validity of this definition. Brown and Ryan (2004) also point out that psychometric testing doesn't support Lau and colleagues measure of mindfulness based on this conceptualisation, as the factor of self-regulating attention wasn't confirmed in the initial validation study, weakening this construct (Lau et al., 2006). It is also argued that this definition is flawed due to the assumption within this that it is possible to be fully attending to experience and curious about the minds activities at the same time (Brown & Ryan, 2004). These are conceptualised instead by Brown and Ryan as distinct entities that cannot coexist simultaneously. Similarly, the terms attention and awareness are used interchangeably by Bishop and colleagues (2004), rather than recognised as separate states, as in Brown and Ryan's conceptualisation of mindfulness, captured within the measure the

Mindful Attention and Awareness Scale (MAAS: Brown & Ryan, 2003). Brown and Ryan's definition describes mindfulness as comprising heightened background awareness with an ability to more precisely focus attention on specific objects, engendering increased awareness of and attention to present events and experience (Brown & Ryan, 2003). Shapiro and colleagues (Shapiro et al., 2006) proposed a form of mindfulness consisting of three components based on Kabat-Zinn's definition highlighted above: intention ("on purpose"); attention ("paying attention"); and attitude ("in a particular way"). These are regarded not as separate entities but interrelated aspects of a single cyclic process occurring simultaneously. The combination of these three factors is proposed to lead to a state that is termed 'reperceiving', an ability to reappraise experience from an alternative and emotionally distant perspective, a notion appearing highly related to the concept of metacognitive awareness. Recent operationalisations of mindfulness are summarised in table 2 below.

Table 2. Contemporary definitions of mindfulness

Authors	Core components
Langer (1989)	Centrality of intellectual aspects of mindfulness.
Brown & Ryan (2003)	Attention (focused) & Awareness (open).
Bishop et al (2004)	Attention regulation and open curiosity/acceptance of moment to moment experience.
Shapiro et al (2005)	<p>Intention; Attention; Attitude. These 3 components occur simultaneously as part of a cyclic process comprising mindfulness.</p> <p>These 3 components lead to 'Reperceiving' – the ability to view thoughts with increased clarity and objectivity.</p>
Leary & Tate (2007)	<p>Mindful attention; Diminished self-talk; Non-judging; Non-doing.</p> <p>Mindfulness existing within a spiritual, religious, therapeutic framework.</p>

In summary, both Buddhist and recent definitions describe mindfulness as essentially the same construct: a state of transparency and openness to subjective momentary experience, regardless of its desirability, allowing informed responses to emerge rather than automatic reactions. Furthermore, all definitions suggest that this process can lead to a fundamentally altered relationship to experience that is characterised by increased wellbeing. It is therefore unsurprising that mindfulness has been integrated into a range of clinical interventions, beginning with the work of Jon Kabat-Zinn in the late 1970s.

2.4.3 Introduction of mindfulness into clinical settings

Building on assertions made by Walsh (1980) and Jung (1969) amongst others (e.g. Deikman, 1982) about the potential value of engaging in Eastern spiritual meditative practices, Jon Kabat-Zinn developed a programme of intensive mindfulness training to be taught to participants experiencing a broad spectrum of physical and mental health problems; Mindfulness-based Stress Reduction (MBSR: Kabat-Zinn et al., 1992). This 8 week group training is aimed at assisting those with chronic disorders to develop skills to better manage these difficulties (Majumdar et al., 2002), due to the heightening of mindful awareness positively altering the patients perception of their symptoms. This facilitates a change in relationship with symptoms as these are observed with non-judgmental attention, allowing alternative, more helpful strategies to emerge, rather than the continuation of self-defeating attempts to resolve these (Ludwig & Kabat-Zinn, 2008). As the fundamental unifying element

across all facets of the MBSR programme (Davidson & Kabat-Zinn, 2004), it is argued that purposeful engagement in mindfulness meditation results in greater levels of mindful awareness (Kabat-Zinn, 2003), and that this is the mechanism mediating improvements in the functioning and well-being of participants (Kabat-Zinn, 1982, Kabat-Zinn et al., 1998, Kabat-Zinn, 2005). This context changes the precise focus of the intervention from attainment of spiritual enlightenment to management of pain and distress.

As the health benefits of mindfulness through MBSR have become more recognised, additional mindfulness-based interventions targeting numerous health disorders have emerged, including Dialectical Behaviour Therapy (DBT: Linehan, 1993), Mindfulness-Based Cognitive Therapy (MBCT: Segal et al., 2002), Relapse Prevention (RP: Marlatt, 2002) and Acceptance and Commitment Therapy (ACT: Hayes et al, 1999). All of these approaches are derived from cognitive behavioural theories of change but also incorporate mindfulness as a central aspect (see table 3 for summary & appendix 1 for a more detailed overview of mindfulness-based interventions). All of these share a striking similarity; instead of attacking symptoms as traditional medicine would do, these approaches instead emphasise a non-judgemental awareness and acceptance of symptoms. These approaches represent the main therapeutic models including mindfulness as a significant component of treatment, though additional applications exist. Of all these approaches, MBCT is the only treatment that specifically aims to address depression.

Table 3. Mindfulness-based approaches

Mindfulness- Based Intervention	Philosophical & Psychological Framework	Mindfulness Components and Cultivation	Target Population
Mindfulness- Based Stress Reduction	Buddhist philosophy using Vipassana meditation Focuses on 7 core attitudes: patience; compassion; etc	Mindfulness: paying attention on purpose, in the present moment, and nonjudgmentally to things as they are Emphasis on learning meditation exercises and home practice to cultivate mindfulness	Broad range of presentations for chronic pain and general stress
Dialectical Behaviour Therapy	CBT and psychodynamic psychotherapy Focuses on dialectical change and acceptance Exercises derived from Zen Buddhism	'What/How' skills of mindfulness: What skills include observing; describing; participating. How skills include: being non-judgmental; acting effectively and one-mindfully.	Borderline Personality Disorder

		Involves short meditations – no home practice	
Acceptance and Commitment Therapy	Behavioural Contextualism Relational Frame Theory Experiential Avoidance Cognitive Fusion	Mindful perspective taught through in-session exercises These develop acceptance of internal experience and lead to cognitive defusion No meditation practices	Psychological and emotional distress
Relapse Prevention Therapy	Buddhist philosophy using Vipassana meditation Cognitive & Behavioural theory of change	Meditation exercises developing ability to resist compulsion to satisfy urges and cravings	People with substance misuse problems
Mindfulness-Based Cognitive Therapy	Cognitive Therapy Vipassana meditation Cultivation of	Mindfulness: paying attention on purpose, in the present moment, and nonjudgmentally to things as they are	People with remitted recurrent depression

	metacognitive awareness	Emphasis on learning meditation exercises and home practice to cultivate mindfulness	
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Throughout the empirical literature numerous benefits arising from the above mindfulness-based approaches are noted. These include improvements in psychological, emotional and physical aspects of wellbeing, for non-clinical populations (for reviews see Chiesa & Serretti 2009; Grossman et al., 2004), people experiencing a range of complex mental and physical health problems (Hofmann et al., 2010; Grossman et al., 2004; Chiesa et al., 2011; Bohlmeijer et al., 2010; Baer, 2003) and for those with depressive disorders.

2.4.4 Mindfulness as a treatment for depression

Employing mindfulness as a strategy to minimise depressive experience builds on cognitive theory/therapy research findings highlighted above focusing on the potential advantages of switching ‘modes of mind’, particularly away from a state of doing/conceptualising into a mode of mindful experiencing/being. Mindfulness has consequently been incorporated into a treatment programme which aims to reduce the risk of depressive relapse in vulnerable individuals – Mindfulness-Based Cognitive Therapy (MBCT: Teasdale et al., 2000). The cognitive theory of depressive relapse focusing on the role of differential activation

hypothesis within ICS therefore underpins this approach, providing a theoretical basis for interventions delivered within this. MBCT is a group treatment combining mindfulness meditation and cognitive therapy. It was developed for use in recurrent depressive disorder as a treatment to prevent depressive relapse in susceptible individuals (Segal et al., 2002). Borrowing heavily from the MBSR programme, MBCT more precisely focuses on targeting processes described above as central to depressive vulnerability: rumination and self-devaluative thinking patterns triggered by a mild drop in mood (Teasdale et al., 2000). MBCT involves attentional training through mindfulness meditation. Through this teaching, participants' become more aware of momentary changes in affect, allowing them to intervene at precisely the point at which low mood typically escalates into depressive relapse (Williams et al., 2007). This is achieved through voluntarily switching modes of mind as conceptualised within the ICS model. MBCT training therefore involves repeatedly practising moving between mindless emoting, conceptualising/doing and mindful experiencing. In this way, the individual becomes directly aware of their tendency to slip into depressive interlock, and becomes skilled at disrupting this process by accessing a mindful perspective. These steps are hypothesised to reduce the risk of depressive relapse (Segal et al., 2013). This assertion was supported by findings from several early randomised controlled trials (RCTs) which demonstrated its effectiveness in reducing the risk of future depressive episodes by up to 50% for those with a history of three or more episodes of depression, and are therefore particularly

susceptible to future relapse (e.g., Teasdale et al., 2000; Ma & Teasdale; 2004, Kuyken et al., 2008). Studies investigating the use of mindfulness for remitted, current, chronic and treatment resistant depression are outlined below.

2.4.4.1 MBCT for depression

Early RCTs of MBCT trials consistently found that this was likely to significantly reduce the risk of relapse for those with a history of three or more depressive episodes compared to TAU (e.g., Teasdale et al., 2000; Ma & Teasdale, 2004, Kuyken et al., 2008). Those with multiple episodes of depression are more likely to have experienced dysfunctional parenting or childhood trauma and MBCT has been found to confer protection from relapse for this subgroup in particular in a recent trial (Williams et al., 2013). Later trials of MBCT for recurrent depression in remission also demonstrate relapse protecting properties, highlighting the utility of this approach in assisting people vulnerable to future depression in remaining well for longer periods (Godfrin & Heeringen, 2010; Bondolfi et al., 2010; Segal et al., 2010; Mathew et al., 2010; Piet & Hougaard, 2011). Moreover, MBCT may offer a similar degree of relapse protection as a maintenance dose of an anti-depressant medication (Kuyken et al., 2015). However, whilst a recent audit found that relapse protection remained for participants of MBCT up to three years post intervention, the numbers included in this trial were too small to generalise findings with any confidence (Mathew et al., 2010). Furthermore, a study seeking to replicate original MBCT studies with a

Swiss population found that whilst time to relapse was significantly longer for the MBCT group compared to TAU, eventual relapse rates were actually the same (Bondolfi et al., 2010). Nevertheless, a recent meta-analysis involving nine studies of MBCT (n=1,258) concluded that it is an effective intervention for relapse prevention in recurrent depression in remission, compared to TAU (hazard ratio 0.69) and also compared to active treatments (hazard ratio 0.71: Kuyken et al., 2016).

These research findings appear to support the hypothesis that an extensive history of depression leads to pathological processes successfully targeted through MBCT. Teaching those susceptible to future relapse MBCT skills whilst in remission significantly reduces this risk. However, processes theorised to trigger relapse are also implicated in maintaining an episode of depression, once activated. Consequently, a number of trials have been conducted testing the impact of delivering MBCT to those in a current episode of depression. Studies consistently highlight statistically significant mean reductions in depressive symptomatology for participants (Finucane & Mercer, 2006; Manicavasgar et al., 2011; Kingston et al., 2007; van Aalderen et al., 2011; Kenny & Williams, 2006; Eisendrath et al., 2008; Barnhofer et al., 2009). A recent large scale RCT (n=205) of MBCT for active levels of depression reported that MBCT was significantly more effective when combined with TAU than TAU alone in reducing symptoms of depression (van Aalderen et al., 2011). Additional studies examine the impact of mindfulness interventions with more intractable types of depression,

including a retrospective audit (Kenny & Williams, 2006) and an uncontrolled study examining the effect of MBCT on TRD, all participants having failed to remit with two previous treatments (Eisendrath et al., 2008). A recent pilot study sought to further illustrate potential benefits of MBCT for chronic depression using a randomised controlled design comparing this to TAU (Barnhofer et al., 2009). All studies report an overall improvement in depressive symptoms. However, despite these generally positive findings, reviews of studies into mindfulness additionally conclude that these tend to be methodologically flawed due to the lack of control groups, absence of active control group treatments, low statistical power and other weaknesses (Hofmann et al., 2010; Chiesa & Serretti, 2011; Baer, 2003), and findings therefore need interpreting with caution.

Whilst the studies outlined in this section have consistently supported the value of MBCT in reducing symptoms of depression and the risk of depressive relapse in a vulnerable population, the mechanisms by which it achieves its effects remain relatively unexplored (Frewen et al., 2008; Heeren & Philippot, 2011; Schroevers & Brandsma, 2010). These studies nevertheless appear to support the hypothesis that (for those with multiple episodes) depression is triggered by the gradual development of autonomous processes that involve the reactivation of depressogenic thinking patterns by dysphoria (Teasdale & Barnard, 1993). MBCT is hypothesised to achieve its effects by disrupting these processes through the development of metacognitive insight and a

mindful perspective. This perspective obstructs rumination and facilitates a more accepting relationship with experience that is typified by a heightened degree of self-compassion towards oneself and one's experiences. Key psychological processes that are therefore targeted in mindfulness for depression are rumination, experiential avoidance and a reduced capacity for self-compassion (Segal et al., 2013).

2.4.5 Rumination, experiential avoidance, self-compassion and their link to mindfulness and depression

2.4.5.1 Rumination

Rumination is a behavioural and attentional pattern preoccupied with analytical focus on the self and reasons for depression (Watkins & Teasdale, 2001), and is described as a key cognitive feature of dysphoria and major depressive disorder (Papageorgiou & Wells, 2003). It is typically regarded as a cognitive process but recently this has been considered within a behavioural model as an action that is functionally comparable to more obvious forms of avoidance, such as social withdrawal and inactivity (Cribb et al., 2006). Rumination may therefore be regarded as a problematic behaviour impeding engagement in more adaptive strategies that would assist recovery from depression. Rumination involves repetitively focusing attention on negative feelings and past events in order to problem solve by identifying causes and possible solutions (Higgins, 1987). However, rumination is actually associated with poor problem solving (Hong, 2007) and is believed to

increase distress due to its repetitive and circular nature rendering decision making problematic (Ward et al., 2003). It has consequently been characterised as:

'An heroic attempt to solve a problem that it (the mind) is not capable of solving' (Williams et al., 2007, p. 45).

Conceptualised as having no immediate emotion production it may be used as a strategy for avoiding engagement with painful emotions. However, the impact of rumination on prolonging depression is well recognised (Teasdale, 1997; Nolen-Hoeksema et al., 1993; Nolen-Hoeksema, 2000), and studies focusing on the impact of rumination compared to distraction in those with low mood have found that it is likely to increase depression, distort thinking, lead to over general autobiographical memory, a reduced sense of control and inhibit problem solving (e.g., Lyubomirsky & Nolen-Hoeksema, 1993; Watkins et al., 2000). Nevertheless, individuals prone to this style of thinking may feel driven to continue its use despite its detrimental effects, partly because of positive beliefs about its benefits (Watkins & Baracaia, 2001).

Whilst rumination increases with onset of depressed mood (Nolen-Hoeksema et al., 1994), those with a history of depression tend to score highly on a rumination measure, even when mood is non-depressed (Roberts et al., 1998), suggesting that this is not solely a mood dependent phenomena for some people. Response style theory (Nolen-

Hoeksema, 1987; 1991) contests that the degree to which an individual's response to negative life events is typified by a ruminative and worrisome thinking style will significantly influence the amount of accompanying emotional distress, including depression. Studies investigating this have found evidence that people reacting to stressful situations (e.g., earthquake; bereavement) by ruminating are more likely to experience depressive symptoms following this (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1994). Consistent with ideas of differential activation of depression (DAH) it is argued that this style of response may be enough to trigger the onset of a depressive episode, thereby constituting a risk factor for a course of recurrent depression (Just & Alloy, 1997). Response style theory also proposes that once depression has been triggered, people with a tendency towards excessive rumination will experience a more intense and protracted course of this (Nolen-Hoeksema, 1987, 1991; Nolen-Hoeksema et al., 1993; Brennan et al., 2015), as people get caught up and overwhelmed by the very thinking they have recruited to rescue them.

The Ruminative Responses Scale (RRS: Treynor et al., 2003), has been the primary measure used in studies investigating the impact and role of rumination in mood disorders including depression (Brennan et al., 2015). In keeping with response style theory this comprises two distinct components that are not confounded with symptoms of depression: reflective pondering, a *“purposeful turning inward to engage in cognitive problem-solving to alleviate one's depression”*, and brooding, *“a passive*

comparison of one's current situation with some unachieved standard."

In the initial validation study of the RRS both elements were associated with active depression but only brooding was correlated with longer term depressive symptoms whilst reflection predicted fewer of these (Treyner et al., 2003). Additional studies reflect these findings (Burwell & Shirk, 2007; Joormann et al., 2006; Siegle et al., 2004) and rumination is now widely regarded to be composed of maladaptive brooding and adaptive reflective pondering (Brennan et al., 2015).

Several studies have tested the relationship between levels of mindfulness and rumination in an effort to establish a link between these two constructs in line with cognitive theories attempting to account for the establishment and maintenance of depressive disorders. Despite some exceptions (Ramel et al., 2004; Kuehner et al 2009), numerous studies demonstrate a negative relationship between mindfulness and rumination, illustrating their apparent incompatibility (Michalak et al., 2011; Deyo et al., 2009; Jain et al., 2007; Border et al 2010; Chambers et al., 2008; Chiesa & Serretti, 2009; Lykins & Baer, 2007). Furthermore, MBCT has been found to positively alter levels of mindfulness and brooding but not reflection in those with an extensive depressive history. These findings indicate that MBCT is effective because it teaches people to engage less in an analytical and evaluative style of self-focused attention: brooding. The apparent reduction in this type of thinking via mindfulness practices is believed to further support Teasdale's theory of depressive vulnerability and the benefits of accessing a state of mindful

experiencing/being (Shahar et al., 2010). Rumination may also be a predictor of relapse that can be successfully mitigated by MBCT (Michalak et al., 2011), leading to increased employment of adaptive and regulatory behaviours potentially protecting vulnerable individuals from relapse (Coffey & Hartman, 2008). A comparison between CBT and MBCT for people with depression found that rumination reduced across both treatment arms and remaining levels of this predicted levels of depression, suggesting that this is an important mechanism of change for both treatments. However, mindfulness scores were particularly related to rumination in the MBCT group, suggesting that mindfulness has a specific relationship with rumination and outcome from MBCT (Manicavasgar et al., 2012). This is consistent with the theorised mechanism of action that MBCT effects rumination through increasing levels of mindfulness.

2.4.5.2 Experiential avoidance

Experiential avoidance is defined as any efforts to avoid thoughts, feelings, bodily sensations and other internal experiences despite the potentially negative impact of doing so. (Hayes et al., 1999). Experiential avoidance has been found to be predictive of emotional distress (Spinhoven et al., 2014; Moore et al., 2009), though it may also be stable independent of fluctuations in mood (Spinhoven et al., 2014). Experiential avoidance may aggravate depression as an ineffective and self-defeating attempt to manage unpleasant experiences accompanying this, such as shame memories (Carvalho et al., 2015), and several

studies link depression and emotional avoidance (Hayes et al., 2004; Tull et al., 2004; Cribb et al., 2006). It has been proposed that chronic avoidance of unpleasant experiences obstructs a process of learning to gradually tolerate distressing material, including negative thoughts, images and memories, making problems associated with these persist for longer (Wenzlaff & Wegner, 2000). Experiential avoidance may also lead to individuals failing to fully recognize problems and take appropriate action (Hayes et al., 2004), instead prompting maladaptive compensatory strategies such as substance misuse or binge-eating, as a means of escaping or distracting from unwanted experiences (Polivy & Herman, 2002). An investigation of vulnerability factors in people with persistent depression reported that this population may be characterised by high levels of experiential avoidance (Barnhofer et al., 2014) and a meta-analysis of studies focusing on the relationship between psychopathology, including depression, and experiential avoidance found a significant correlation between these (Hayes et al., 2006).

An adaptive alternative to experiential avoidance involves cultivating an increased ability to recognize and approach unwanted experiences. This involves the deliberate cultivation of 'acceptance' and is a key focus of a recently developed corresponding treatment; Acceptance and Commitment Therapy (ACT: Hayes et al., 1999). Described as the process of actively embracing internal events without attempts to change them (Fletcher & Hayes, 2005), acceptance is an underpinning theme within all main mindfulness based approaches, including ACT (Brown et

al., 2007). Several authors describe the ability to remain in contact with negative internal experiences as a key outcome arising from mindfulness practices that may in part account for benefits arising from this (Shapiro et al., 2006; Baer, 2003; 2007; Brown et al., 2007; Hayes et al., 1999; Kumar et al., 2008; Baer et al., 2008). As mindfulness practices provide meditation based opportunities for exposure to avoided phenomena such as unpleasant memories, catastrophic imagery etc, this allows the individual to develop a more tolerant and accepting attitude to such experiences, reducing distress accompanying these (Felder et al., 2003). This response is in clear contrast to a more experientially avoidant approach, whereby attempts to eradicate unwanted phenomena reinforce a belief of their toxicity to the individuals wellbeing, resulting in behaviours that may be more likely to maintain emotional disturbance (Hayes et al., 2006). Research trials utilising a measure of experiential avoidance, the Acceptance and Action Questionnaire (AAQ: Hayes et al., 2004) consistently show a negative correlation between psychological wellbeing and experiential avoidance (Baer et al., 2008; Bohlmeijer et al., 2011; Hayes et al., 2004) and engagement in mindfulness-based approaches, including ACT and MBCT is associated with decreases in experiential avoidance and increases in mindfulness (Roemer et al., 2009; Sachse et al., 2011). Participation in ACT has also been found to significantly reduce symptoms of depression (Roemer et al., 2009). Experiential avoidance is also repeatedly found to have a negative relationship with mindfulness, consistent with explanations of how mindfulness achieves therapeutic benefit (Baer et al., 2008; Kumar et al.,

2008; Bohlmeijer et al., 2011; Masuda & Tully, 2012; Silberstein et al., 2012; Hooper et al., 2010).

2.4.5.3 Self-Compassion

A central component of Christian and Buddhist religions, compassion has been defined as sensitivity to the suffering of oneself and others coupled with a sincere commitment to prevent or alleviate it (The Dalai Lama, 1995). It is further described by Feldman and Kuyken (2011) as:

“An orientation of mind that recognises pain and the universality of pain in human experience and the capacity to meet that pain with kindness, empathy, equanimity and patience. While self-compassion orients to our own experience, compassion extends this orientation to others experience” (p.143).

The cultivation of self-compassion is a central concept within Buddhist philosophy and teachings (Gunaratana, 2001) that has recently been incorporated into psychological therapies as a method for understanding and assisting recovery from depression and other psychological conditions (Leary et al., 2007; Neff, 2003a; Neff et al., 2007; Gilbert, 2005). Kristin Neff is a leading researcher of self-compassion and describes this as the ability to be moved by one's own pain without attempts to disengage from this, motivating the wish to relieve and bring kindness to the suffering, as this is viewed from a perspective of common human experience, rather than reflecting individual inadequacy

and defects (Neff, 2003a). This description of self-compassion therefore posits that it consists of three related elements when experiencing distressing thoughts and feelings: self-kindness versus self-judgment, a sense of common humanity versus isolation, and mindfulness versus over-identification (Neff et al., 2003b). Self-compassion is therefore distinct from self-pity, self-centeredness, or self-esteem (Neff, 2003a).

Self-kindness versus self-judgment

This component of self-compassion refers to the ability to bring friendliness and goodwill to oneself and one's experiences, rather than harsh judgements and self-criticism. The capacity for self-kindness is not contingent on achieving or meeting predetermined standards but acknowledges that one deserves happiness and love even after failing to achieve desired goals (Barnard & Curry, 2011). Self-kindness allows for an objective evaluation of an individual's performance with any perceived errors in this being openly accepted and taken responsibility for without recourse to guilt, shame and self-loathing. Instead this is responded to with self-forgiveness and understanding (van der Cingel, 2009).

Common humanity versus isolation

Common humanity in self-compassion involves recognising that all humans are fallible and prone to making mistakes, rather than these being interpreted as a unique failing of the individual. Thus common humanity facilitates self-forgiveness for being human, and consequently, imperfect and limited (Neff, 2003a). This acknowledgement of the

universality of suffering that is part of the shared human condition provides a sense of belonging and connection with others (Neff et al., 2007), counteracting the tendency to believe that suffering is a solitary experience, which may otherwise add to this through a sense of isolation and loneliness (van der Cingel, 2009). The evolutionary drive to feel connected to others as a means of maximising opportunities for survival and emotional wellbeing is put forward as a theoretical basis for Compassion Focused Therapy (Gilbert, 2005; Gilbert & Proctor, 2006).

Mindfulness versus over-identification

The experience of self-compassion relies on the individual being able to fully connect with aspects of experience without avoiding or distracting from these. Without awareness of suffering it is not possible to bring compassion to this and mindfulness is therefore a core component of self-compassion (Neff, 2003a). Mindfulness prevents the person becoming overwhelmed by endlessly brooding on distress, enabling detachment from upsetting emotional states and facilitating the understanding that these are impermanent (Ladner, 2004). The ability to be aware of moment to moment experience includes noticing the tendency to be drawn into 'over-identification', a type of rumination focusing on the causes and implications of suffering liable to lead to self-criticism and low self-worth (Neff, 2003b).

Self-compassion is put forward as a factor influencing outcomes from mindfulness practices following recent studies examining the relationship

between these constructs. Studies exploring participants subjective experience of mindfulness-based interventions have found the development of a more accepting and compassionate attitude to be a notable feature of these (Mason & Hargreaves, 2001; Finucane & Mercer, 2006; Langdon et al., 2012; York, 2007). Self-compassion has been found to be a significant predictor of happiness, optimism, and positive affect (Neff & Vonk, 2009), and a more robust predictor of depression and anxiety than mindfulness (Van Dam et al., 2011) and is associated with increases in general psychological well-being (Diedrich et al., 2014; Neff et al., 2007). Furthermore, changes in self-compassion strongly predict changes in mindfulness during meditation training (Shapiro et al., 2007) and has been found to mediate increases in quality of life and decreases in general psychological distress and perceived stress following a mindfulness-based intervention (Shapiro et al., 2005). A pilot study examining the impact of a programme incorporating self-compassion as the key component alongside mindfulness found significant improvements in measures of psychological wellbeing, including depression and mindfulness, compared to the control group (Neff & Germer, 2013).

Investigation of cognitive reactivity in people with reoccurring depression identified that whilst engagement in MBCT led to improvements in depression, mindfulness and self-compassion, cognitive reactivity did not reduce following MBCT, and actually slightly increased, challenging the notion that mindfulness exerts its effects by directly reducing reactivity

(Kuyken et al., 2010). Instead, regression analyses indicated that self-compassion mediated the positive outcomes described. Consequently, there is evidence that compassion nullifies the effects of reactivity for those undergoing MBCT, potentially enabling a disengagement from ruminative, experientially avoidant processes liable to trigger relapse as theorised within DAH (Teasdale & Barnard, 1993). Therefore, it was found that MBCT doesn't directly reduce cognitive reactivity, but instead appears to mitigate its effects by generating heightened levels of self-compassion which prevent a downward spiral of mood. Consequently, it is the person's response to reactivated dysfunctional thoughts that changes for the better. MBCT appears to do this by increasing self-compassion. However, whilst self-compassion mediated improvements described, it is not possible to establish this as a causal factor due to the study design lacking time delays between measurement of variables. These findings support the importance of self-compassion as an element of definitions of mindfulness existing both within Buddhist (e.g. Thera, 1962) and contemporary empirical literature (e.g. Shapiro et al., 2006); that this involves bringing a compassionate, accepting and non-judgmental quality of attention to aspects of moment to moment experience.

In summary, numerous studies as outlined above indicate the incompatibility of simultaneously high levels of mindfulness and depression and suggest that increasing levels of mindfulness may be an effective method for reducing depression. Several key processes

involved in this include rumination, experiential avoidance and self-compassion as captured by relevant self-report instruments.

Studies in clinical settings tend to focus on statistical findings indicating treatment outcomes (Biggerstaff et al., 2008) and investigations of mindfulness and depression identified above predominantly employ quantitative methods. Whilst important, this research method is less able to inform researchers about the detail of participants' lived experience. As a consequence, the viewpoint of the participant about their experience of illness or treatment is likely to be overlooked, and the importance of gathering information from this perspective is increasingly understood in healthcare research (Hodgetts & Wright, 2007). Without this, key factors influencing the problem being investigated cannot be considered either in gaining a deeper understanding of the problem, or in developing more effective methods of combating this (Williams et al., 2011).

2.4.6. Qualitative research exploring mindfulness in depression

Qualitative research can explore explanatory processes and capture the detail of peoples lived experience more fully than may be yielded by self-report questionnaires alone, which inevitably provide only limited interpretations of this (Grossman, 2011). As mindfulness training for depression is an experiential phenomenon it is important as well as potentially revealing to ask people about their experience of this, if it is to be more deeply understood (Allen et al., 2009). Qualitative research of

mindfulness thus far has almost exclusively explored subjective experiences of people undergoing mindfulness training in a range of populations, examples of which include people with psychosis (Ashcroft et al., 2011), bipolar affective disorder (Chadwick et al., 2011), intellectual disabilities (Chapman & Mitchel, 2013), adolescents (Broderick & Metz, 2009), diabetics (Dreger et al., 2015), psychotherapists (Christopher et al., 2011), athletes (Breigel-Jones et al., 2013) and singers (Czajkowski et al., 2015). In addition to these populations a proportion of studies specifically investigate the impact of mindfulness training on people with depressive disorders. The acceptability of mindfulness interventions as a treatment for depression is generally reported by these studies of mindfulness and depression (Cebolla et al., 2009; Mason & Hargreaves, 2001; Finucane & Mercer, 2006). Its acceptability to participants is indicated by low attrition rates and positive descriptions of engaging in such programmes, including statements referring to this as “*brilliant*” and “*of great help*” (Cebolla et al., 2009, p. 11).

Studies focusing on the use of mindfulness training for depression frequently report participants identification of acceptance towards experience as a significant feature developed through engagement with mindfulness meditation practices (Mason & Hargreaves, 2001; Langdon et al., 2011; York, 2007; Allen et al., 2009; Bihari et al., 2014; Malpass et al., 2015; Malpass et al., 2012; Higginson et al., 2008; Cebolla et al., 2009). For example, a study of eight participants with a range of mental

health problems including depression involved participation in an abridged version of MBCT on an in-patient unit (York, 2007). Following completion of the programme participant interviews were analysed thematically leading to the identification of 10 themes, one of which included 'acceptance' indicating a more non-judgemental attitude to oneself and experiences post intervention, captured in participant quotes such as, "*noticing of the here and now without judgement*" (p. 605).

Studies also typically report participant descriptions of an increased ability to notice bodily sensations and other internal phenomena as a consequence of increased mindfulness (Kerr et al., 2011; Langdon et al., 2012; Mason & Hargreaves, 2001; Morone et al., 2008; Allen et al., 2009). Increased awareness of this sort is associated with an increased ability to notice early warning signs of low mood enabling relapse preventing actions to be taken such as activity scheduling, which can help to manage depressive symptoms (Allen et al., 2009). Increased awareness arising from mindfulness training can also facilitate disruption of rumination through the development of an increasingly decentred perspective (Kerr et al., 2011) thereby potentially avoiding depressive relapse (Malpass et al., 2012). The development of heightened self-awareness, attitudes and skills attained through mindfulness training are additionally described in studies as providing a greater sense of control, empowerment and agency as participants feel increasingly able to influence their mood directly, rather than being at the mercy of processes

beyond their control (Allen et al., 2009; Cebolla et al., 2009; Malpass et al., 2012; Malpass et al., 2015).

Several qualitative studies additionally report participant's descriptions of positive changes in their relationships following completion of mindfulness courses (Lilja et al., 2015; Bihari et al., 2014; Allen et al., 2009; Cebolla et al., 2009). Changes in relationships may include an altered relationship with oneself as well as others, and a more self-compassionate, accepting relationship towards oneself and one's experiences is noted as a feature associated with participation in mindfulness programmes (Malpass et al., 2012). For example, a study interviewing participants with recurrent depression (n=20) 12 months post intervention, identified the theme of 'relationships' using thematic analysis (Allen et al., 2009). This theme captured participants' experience of improved relationships following MBCT for depression, attributed to a sense of increased self-worth positively influencing relationships with others. This was associated by participants with improved communication with, and empathy for loved ones.

In addition to themes identified in qualitative studies as positive aspects of undertaking mindfulness training for depression, some studies noted participant responses indicating a negative association with this. For example, the theme of 'struggle' was identified in one study which highlighted the difficulty and disappointments associated with mindfulness training, including the challenge of completing mindfulness

practices between weekly sessions (Allen et al., 2009). A further difficulty noted by some participants in another study was a reluctance to attend follow up meetings post programme due to a tendency to make unfavourable comparisons with other participants leading to a feeling of inferiority (Hopkins & Kuyken, 2012). Another study focusing on mindfulness training for nurses to tackle symptoms of depression and anxiety reflects that attendance is not uniformly accompanied by positive change, as captured by the following quote, “*Hasn’t worked for me as I’m still going at 100 miles an hour*” (Foureur et al., 2013, p. 121). Overall however, qualitative studies to date suggest that mindfulness training leads to several key changes positively influencing participants’ experience of depression. Many of these are reflected in the intended goals of mindfulness training including an increased capacity for acceptance, awareness and an ability to step back and attain a decentred perspective on ruminative, negative thinking (Malpass et al., 2012). The importance of these elements in depressive experience is further identified in the wider literature including qualitative studies investigating the subjective experience of depression. These frequently indicate the negative impact of rumination and repetitive thinking on mood, and highlight how the onset of depression is accompanied by a reduced sense of self-worth (e.g., Amini, 2013; Smith & Rhodes, 2015; Wittkamp et al., 2008). However, whilst the studies outlined in this section explore participants’ experience of engaging in mindfulness interventions for depression, to the best of the author’s knowledge, there are no qualitative studies exploring whether changes in mindfulness are

identified by depressed individuals as a relevant feature of their experience of depressive disorder, in those without prior mindfulness experience. Therefore, in addition to investigations of the impact of mindfulness training on depressive experience, qualitative exploration of the relationship between mindfulness and depression in those naïve to mindfulness training may increase understanding of their relationship and clarify the role, and potential value, of mindfulness in the experience and management of severe and persistent depression.

Despite the existence of many quantitative and qualitative studies suggesting the benefits of mindfulness in alleviating depression, progress in this area is complicated by a lack of agreement about the nature and constituents of mindfulness and the variety of definitions of this that consequently exist (Malinowski, 2008, Dorjee et al., 2010; Hussain & Bhushan, 2010; Chiesa and Malinowski, 2011, Singh et al., 2008, Brown et al., 2007). The lack of a consensus definition of mindfulness complicates further explication of processes involved in this and weakens conclusions arising from such research. To further explore the role of mindfulness in depression more precisely, a clear definition and a reliable method of measuring mindfulness are required. Whilst operational definitions have recently been put forward and a number of self-report questionnaires have been devised, a number of difficulties exist in trying to define this construct.

2.4.7 Difficulties and complications in defining mindfulness

The lack of an agreed definition makes researching mindfulness and its properties difficult, and complicates attempts to interpret outcomes of interventions using this approach (Malinowski, 2008). However, an attempt to develop a definition that is consistent with a wide range of perspectives and paradigms is fraught with difficulty for a number of reasons. For example, as highlighted above mindfulness originates from Buddhist philosophy and teachings. Whilst interest in its therapeutic properties has substantially increased, there are nevertheless questions as to whether it is actually possible to isolate mindfulness as a factor distinct from Buddhism or whether this results in a form of mindfulness that is subtly, but fundamentally different (Dryden & Still, 2006). Other writers in this field concur with this view, stating that mindfulness should not be separated from its spiritual background, in order to make it palatable to a secular, 'westernised' population. It has been declared that attempts to do so reduce its validity both as a concept and as a clinical tool (Mikulas, 2011; Kang & Whittingham, 2010, Grossman, 2011, Dimidjian & Linehan, 2003). However, whilst some argue for a definition of mindfulness that is in keeping with a Buddhist conceptualisation (Grossman, 2011), this fails to acknowledge the conflicting opinions within Buddhism about this topic (Carmody, 2009). As different Buddhist traditions emphasise different aspects of mindfulness within their teachings, subtly distinct interpretations of this construct are likely to emerge (Dorjee et al., 2010, Kang & Whittingham, 2010). Multiple conceptualisations also exist within contemporary academic and

empirical literature, often designed for use in a research setting. This makes them easier to utilise and measure but may result in a changed construct removed from a classical understanding of mindfulness (Chiesa & Malinowski, 2011). Attempting to arrive at a universal definition that conforms to such diverse psychological and spiritual approaches is consequently likely to be problematic. It is also argued that it may be impossible to capture mindfulness in a measure or any form attempting to only use words, due to the involvement of subtle non-verbal experience within mindfulness (Malinowski, 2008). As a consequence, measures may end up having to capture outcomes and associated behaviours, rather than mindfulness itself (Chiesa & Malinowski, 2011), as evident in the FFMQ, components of which reflect consequences of being mindful e.g., the ability to describe thoughts/emotions, rather than actual mindfulness (Brown et al., 2007).

Despite the problems in attempting to reach a consensus definition of mindfulness, it is nonetheless necessary to attempt this if mindfulness-based interventions are to be effectively evaluated and its role in depressive disorders accurately investigated (Brown & Ryan, 2004). Consequently, further to the conceptualisations of mindfulness as summarised above, there exist a number of self-report measures that each capture different elements of the construct of mindfulness.

2.4.8 Quantifying Mindfulness: self-report questionnaires

Several self-report questionnaires of dispositional mindfulness have been developed during the past 15 years, each one representing an attempt to quantify the construct of mindfulness. In total there are currently ten such questionnaires in existence. These include: the Freiburg Mindfulness Inventory (Buchheld et al., 2001); the Toronto Mindfulness Scale (Lau et al., 2006); the Mindful Attention Awareness Scale (Brown & Ryan, 2003); the Kentucky Inventory of Mindfulness Skills (Baer et al., 2004); the Five Facets Mindfulness Questionnaire (Baer et al., 2006); the Cognitive and Affective Mindfulness Scale – Revised (Feldman et al., 2007); the Philadelphia Mindfulness Scale (Cardaciotto et al., 2008); the Southampton Mindfulness Questionnaire (Chadwick et al., 2008); and the CHIME- β (Bergomi et al., 2013). These measures have been developed to capture key aspects of mindfulness and determine levels existing in respondents at time of completion. Each measure emphasises different dimensions of this construct reflecting the varying influences informing their development and their theoretical underpinnings. All are rated using a Likert scale, ranging in number of items from 12 (the Cognitive and Affective Mindfulness Scale – Revised, Feldman et al., 2007) to 39 (The Kentucky Inventory of Mindfulness Skills: KIMS, Baer et al., 2004; Five Facets Mindfulness Questionnaire: FFMQ, Baer et al., 2006). Psychometric testing of all these measures overall supports initial confidence in their reliability (Cronbach's alpha scores ranging from 0.65 for the CHIME- β to 0.94 for the Freiburg

Mindfulness Inventory), and validity, demonstrated by correlational patterns which are generally consistent with predictions.

The Freiburg Mindfulness Inventory (FMI: Buchheld et al., 2001) consists of 30 items and appears to be the first mindfulness questionnaire to be created and was developed with experienced meditation practitioners who were on a mindfulness retreat. As a result it includes items that may not be readily understood by novice meditators and therefore may not have as much clinical utility as some of the later measures. A unidimensional construct, the factor structure was found to be unstable over time during initial psychometric testing (Buchheld et al., 2001). The Mindful Attention Awareness Scale (MAAS: Brown and Ryan, 2003) has 15 items and measures mindfulness as a unidimensional construct comprising a heightened awareness of and attention to present reality, requiring openness to experience (Brown & Ryan, 2003). The MAAS is however criticised for its lack of items reflecting an attitude of acceptance, a central aspect of mindfulness (Cardaciotto et al., 2008; Feldman et al., 2002). The Kentucky Inventory of Mindfulness Skills (KIMS: Baer et al., 2004) is designed to assess mindfulness in daily life and composed of four dimensions according to Linehan's Dialectical Behaviour Therapy (Linehan, 1993). Dimensions include: observing internal and external stimuli; describing and labelling phenomena nonjudgmentally; acting with awareness and undivided attention; and accepting events or experiences without judging them. Containing 39 items it is significantly longer than other mindfulness measures,

increasing respondent burden (Feldman et al., 2002). The Toronto Mindfulness Scale (TMS: Lau et al., 2006) is a 13 item scale for use immediately following a 15 minute meditation exercise to measure the state level of mindful self-regulation of attention and approach to experience that was present during this. The TMS consists of two subscales: curiosity, reflecting an ability to approach and be interested in experience without judging this; and decentring, which is characterised by the capacity to step back from thinking, rather than identifying personally with this. As a measure of state mindfulness the TMS contrasts with other measures which aim to capture levels of mindfulness within everyday life. Its use is therefore limited only to people who engage in a mindfulness meditation practice. As a consequence of this limitation, a state version of this measure has been developed containing the same items but with items worded in the present tense (Davis et al., 2009). Another state measure of mindfulness has recently been developed consisting of 23 items (Tanay & Berstein, 2013). The State Mindfulness Scale (SMS) is completed by people engaging in a mindfulness exercise in an attempt to measure levels of this whilst practicing mindfulness. The Mindfulness Questionnaire (later referred to as the Southampton Mindfulness Questionnaire, SMQ: Chadwick et al., 2008) was developed to measure ability to bring mindful awareness to distressing thoughts and images. Primarily developed for use in people with psychosis, the measure comprises 16 items, which are proposed to capture mindful observation, letting go, nonaversion, and nonjudgement within a single factor. The Cognitive and Affective Mindfulness Scale

(Feldman et al., 2002) was updated to create the Cognitive and Affective Mindfulness Scale – Revised (CAMS; (CAMS-R: Feldman et al., 2007), a 12 item measure that conceptualises mindfulness as comprising four processes required to attain a state of mindfulness: attention regulation; orientation to present moment experience; awareness; and acceptance. However, these are not scored separately as subscales. The Five facets Mindfulness Questionnaire (FFMQ; Baer et al., 2006) consists of 39 items and conceptualises mindfulness as consisting of five interrelated factors: Observe, Describe, Nonreact, Nonjudge and Actaware. The Philadelphia Mindfulness Scale (PHLMS: Cardaciotto et al., 2008) is a 20 item bi-dimensional measure of mindfulness constructing mindfulness as present moment awareness and acceptance based on definitions of mindfulness outlined by Kabat-Zinn (1990) and Bishop and colleagues (Bishop et al., 2004). A measure has recently been developed in the form of the 28 item CHIME- β which is based on a review of components of all pre-existing eight mindfulness measures (Bergomi et al., 2013). This new measure has been found to consist of four factors (Bergomi et al., 2013) and eight factors (Bergomi et al., 2014) in psychometric investigations of this. The key components of mindfulness questionnaires are summarised in the table below.

Table 4. Summary of mindfulness questionnaires

Mindfulness questionnaire & State/Trait	Number of items	Factor structure	Example items
The Freiburg Mindfulness Inventory (FMI: Buchheld et al., 2001) Trait	30	Single factor comprising: Present moment disidentifying attention Non-judgemental, nonevaluative attitude toward self and others Openness to negative mind states Process orientated, insightful understanding	<i>"I let my thoughts run away with me"</i> <i>"I accept myself as I am"</i> <i>"I see how I create my own suffering"</i> <i>"I observe how experiences arise and fade away"</i>
The Mindful Attention Awareness Scale (MAAS:	15	Single factor comprising: Awareness &	<i>"I break or spill things"</i>

Brown and Ryan, 2003)		Attention	<i>because of carelessness, not paying attention, or thinking of something else”</i>
Trait			
The Toronto Mindfulness Scale (TMS; Lau et al., 2006; Davis et al., 2009)	13	Two factors: Curiosity Decentering	<i>“I was curious about my reaction to things”</i> <i>“I experienced myself as separate from my changing thoughts and feelings”</i>
State (Bishop et al., 2003) & Trait (Davis et al., 2009)			
The Kentucky Inventory of Mindfulness Skills (KIMS: Baer et al., 2004)	39	Four factors: Observe Describe	<i>“I notice changes in my body, such as whether my breathing slows down or speeds up”</i> <i>“I can easily put my beliefs, opinions and expectations</i>
Trait			

		<p>Non-judge</p> <p>Act aware</p>	<p><i>into words”</i></p> <p><i>“I tend to evaluate whether my perceptions are right or wrong”</i></p> <p><i>“I get completely absorbed in what I’m doing, so that all my attention gets focused on it”</i></p>
<p>Southampton Mindfulness Questionnaire, (SMQ: Chadwick et al., 2008)</p> <p>Trait</p>	16	<p>Single factor comprising:</p> <p>Decentred awareness of cognitions <i>versus</i> lost in reacting</p> <p>Allowing attention to remain with difficult cognitions <i>versus</i> experiential avoidance</p> <p>Accepting difficult thoughts/images and</p>	<p><i>“Usually when I experience distressing thoughts and images.....”</i></p> <p><i>“I am able just to notice them without reacting”</i></p> <p><i>“In my mind I try and push them away”</i></p> <p><i>“I try just to experience the thoughts or images without</i></p>

		<p>oneself, <i>versus</i> judging cognitions and self</p> <p>Letting difficult cognitions pass without reacting</p> <p><i>versus</i> rumination/worry</p>	<p><i>judging them”</i></p> <p><i>“They take over my mind for quite a while afterwards”</i></p>
<p>The Cognitive and Affective Mindfulness Scale - Revised (CAMS-R: Feldman et al., 2007)</p> <p>Trait</p>	12	<p>Single factor comprising:</p> <p>Attention</p> <p>Awareness</p> <p>Present-focus</p> <p>Acceptance</p>	<p><i>“It is easy for me to concentrate on what I am doing”</i></p> <p><i>“I am easily distracted”</i></p> <p><i>“I am preoccupied by the future”</i></p> <p><i>“I am able to accept the thoughts and feelings I have”</i></p>
The Five	39	Five factors:	

<p>Scale (PHLMS: Cardaciotto et al., 2008)</p> <p>Trait</p>		<p>Awareness</p> <p>Acceptance</p>	<p><i>"I am aware of what thoughts and feelings are passing through my mind"</i></p> <p><i>"I try to distract myself when I feel unpleasant emotions"</i></p>
<p>CHIME- β (Bergomi et al., 2013)</p> <p>Trait</p>	<p>28</p>	<p>Four factors:</p> <p>Accepting, nonreactive & insightful orientation</p> <p>Present awareness</p> <p>Describing of experiences</p> <p>Open, non-avoidant orientation</p>	<p><i>"I can accept myself as I am"</i></p> <p><i>"When I eat, I consciously pay attention to the taste of the food"</i></p> <p><i>"I have trouble finding the right words to express my feelings"</i></p> <p><i>"When I am in pain, I try to avoid the sensation as much as possible"</i></p>

State Mindfulness Scale (SMS) (Tanay & Berstein, 2013) State	23	Two factors: Mindfulness of bodily sensations Mindfulness of mental events	<i>"I felt in contact with my body"</i> <i>"I noticed thoughts come and go"</i>
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A further set of mindfulness measures focus on mindfulness within specific populations, such as the Mindful Eating Questionnaire (Framson et al., 2009) and the Child and Adolescent Mindfulness Measure (CAMM: Greco et al., 2011). In addition to these there are several other questionnaires incorporating elements of mindfulness within them, such as the Self-Compassion Scale (Neff, 2003a), which has a subscale labelled 'mindfulness', and Langer's Mindfulness/Mindlessness Scale (Bodner & Langer, 2001), capturing a Western conceptualisation of mindfulness, conceived within a cognitive information-processing framework (Haigh et al., 2010). However, such conceptualisations appear markedly distinct from other definitions and tend not to be referred to as mindfulness measures in the literature focusing on this topic.

A number of weaknesses of existing mindfulness measures summarised in Table 4 above currently exist, in addition to the general problems of

self-report data, such as biases arising from social desirability and other response styles (Cohen, 2005). Specific criticisms include the observation that western psychological approaches to mindfulness involve attempts to isolate this from its spiritual and ethical framework in a way that distorts the meaning of this construct. Such conceptualisations are argued to lack content validity as they may fail to take into account its subtleties and complexities, leading to a limited version of mindfulness that relates more specifically to lapses in attention rather than mindfulness (Grossman, 2011). Additionally, it may be difficult for people to recognise and consequently endorse items related to mindfulness given that a requisite level of present moment awareness is needed if the presence or absence of this is to be noticed and subsequently rated accordingly on measures (Burg & Michalak, 2011). A sufficient level of mindfulness is therefore required in order to accurately complete measures of this. A further complication is that items may be understood differently across different groups, weakening validity of the construct which are typically validated with convenience samples consisting of student populations. For example, items within the Observe facet of the FFMQ and the KIMS relating to awareness of bodily sensations are likely to be understood differently by someone with meditation experience who may observe these with an open and accepting awareness, compared to someone without such meditation experience, who may instead regard observation of these as unwelcome and worrying events (Grossman, 2011). Moreover, a recent qualitative study found that individuals without meditation experience

misunderstood the majority of items in the FMI (Belzer et al., 2013). In response to such criticisms alternative methods of measuring this construct have been developed including the Mindful Breathing exercise (MBE: Burg & Michalak, 2011), and the Meditation Breath Attention Scores (MBAS: Frewen et al., 2008; 2011). These involve participants engaging in a mindfulness of breathing practice and then at several points throughout this exercise indicating whether their attention remains fixed on the breath or has moved to another object, typically thinking, daydreaming etc. This exercise therefore provides a score of attention on the breath. Psychometric testing of these methods of assessing state mindfulness provide tempered support for their validity as nonverbal assessments of mindfulness (Burg & Michalak, 2011; Frewen et al., 2008; 2011). However, despite the advantage of a test of mindfulness not dependant solely on verbal means, it is unclear that the MBE and MBAS are measures of mindfulness given that focusing on the breath may be considered more an exercise in concentration, rather than mindfulness. Whilst there may be overlap between these two states, they may nevertheless be regarded as distinct, weakening any assertion that this test is providing a measure of mindfulness. Moreover, a study unexpectedly concluded that there was no overlap between state and trait mindfulness, potentially signifying that levels of mindfulness during practice are not generalised into daily life, further questioning the validity and utility of measures of state mindfulness (Thompson & Waltz, 2007). A further method proposed for measuring mindfulness is the use of word counting; noting the language individuals use to describe their

experience of mindfulness as an observable behavioural indicator of the development of this in people who have been through a mindfulness training programme (Collins et al., 2009). Some initial support was found in early tests of convergent and predictive validity of this approach to measuring mindfulness (Collins et al., 2009). However, a weakness of this approach is its limited application to people who have engaged in a mindfulness programme. This limitation is true also for a newly devised self-report scale capturing participants' ability to consciously use mindfulness in daily life (Li et al., 2015). Items are prefaced with the statement "*I used mindfulness practice to...*" before using a Likert scale to rate items such as "*observe my thoughts in a non-attached manner*".

Despite problems inherent in attempting to measure mindfulness, attempts to do so continue, predominantly through the use of self-report measures in order to extend knowledge about this construct and increase understanding of its role in mental health and wellbeing, including the experience of depression. All mindfulness measures identified above offer advantages and disadvantages in relation to their conceptual scope, defining the construct from a range of alternative viewpoints, variations in the trait-state continuum, and in terms of their length and generalisability to different populations. The CAMS-R, FMI, MAAS and SMQ propose a holistic conceptualisation of mindfulness in which components cannot be meaningfully separated. The TMS, KIMS, PHLMS, CHIME- β , SMS and the FFMQ instead support a multidimensional conceptualisation of mindfulness, arguing that a

multifaceted approach to measurement allows for individual mindfulness components to be understood in terms of their relationship to other constructs, thereby increasing our understanding of mindfulness itself (Baer et al., 2006; Cardaciotto et al., 2008), and potentially clarifying mechanisms through which mindfulness achieves therapeutic effects. Of all the established mindfulness measures, the FFMQ is arguably the most comprehensive due to its inclusion of items from several other mindfulness questionnaires and composition of five facets comprising an overarching construct of mindfulness.

2.4.9 Five Facets Mindfulness Questionnaire

The FFMQ was created by pooling all 112 items from the five pre-existing mindfulness questionnaires (MAAS; FMI; KIMS; MQ; CAMS) and subjecting these to psychometric testing with a sample of psychology students (n=613). All individual measures were found to possess good internal consistency with Cronbach alphas ranging between 0.84-0.87. However, whilst items within these individual measures are strongly correlated with each other, relationships between the measures, though significant are less so, reflecting differences in each questionnaire's construct of mindfulness. Potentially different interpretations of mindfulness are further illustrated by each measures distinctive correlations with key variables. For example, a negative correlation between experiential avoidance and mindfulness was found in all measures as predicted. However, scores varied from -0.32 (MAAS)

to -0.60 (MQ). Such differences suggest that each questionnaire includes different elements comprising a construct of mindfulness.

Exploratory and confirmatory factor analysis of the 112 items identified five identifiable elements that are internally consistent and only modestly correlated with each other. The items with the highest loadings on the five factors were selected for inclusion in the facet subscales. Analyses therefore suggested that five distinct facets are represented within the currently available mindfulness questionnaires. The five facets are labelled: Observing, Describing, Nonjudge, Nonreact and Actaware. Though pre-existing measures contribute to the five facets included within the FFMQ, four of these facets included already existed in the KIMS (Observe, Describe, Nonjudge and Actaware). The additional facet Nonreact was derived from items within the MQ and FMI. Cronbach's alpha coefficients for each subscale were: Observe 0.83; Describe 0.91; Nonreact 0.75; Nonjudge 0.87; and Actaware 0.87, demonstrating good to excellent internal consistency. Correlations between most of the subscales were significant, though not strong, ranging from 0.15 to 0.34, demonstrating that the facets have substantial non-overlapping content. However, the relationship between Nonjudge and Observe, was nonsignificant at -0.07. A later study (Baer et al., 2008) included participants with meditation experience. In this study the relationship between Observe and Nonjudge was positive (0.49), supporting the hypothesis that observing is helpful when done mindfully, but incompatible with a mindful perspective when not. Correlations between

all facets within this later study range from 0.32 to 0.56 indicating that these are related yet distinct. These findings therefore suggest that the five facets have good internal consistency and are only modestly correlated with each other.

Construct validity was further tested through a process of making predictions about specific facets and their correlation with variables related to psychological difficulties (Baer et al., 2006). The strongest correlations were consistent with predictions as shown in table 5.

Table 5. FFMQ and predicted correlations

	Observe	Describe	Nonreact	Nonjudge	Actaware
Openness to experience	0.42**				
Emotional intelligence		0.60**			
Alexithymia		-0.68**			
Dissociation					-0.62**
Absent Mindedness					-0.61**
Psychological symptoms				-0.50**	
Neuroticism				-0.55**	
Thought suppression				-0.56**	
Emotion regulation				-0.52**	
Difficulties					
Experiential avoidance				-0.49**	
Self-compassion			0.53**		

**p<0.001

Investigation of the relationship between the FFMQ and related variables highlighted the unexpected behaviour of the facet Observe. This occurred with a number of negative constructs such as thought

suppression and absentmindedness. However, when calculated in a subsample of participants with meditation experience, these unexpected correlations became non-significant. This finding fits with the suggestion that Observe relationship with other variables is dependent on meditation experience as described above. In Baer and colleagues later study comparing those with and without meditation experience (Baer et al., 2008), construct validity was further supported, replicating findings that for those with meditation experience, Observe was correlated as predicted with variables.

In the development of the FFMQ (Baer et al., 2006) regression analyses were conducted to explore incremental validity of facets in relation to psychological symptoms. Examination of correlations between specific elements of mindfulness and mental health may provide important information about influencing factors that may subsequently be targeted through interventions, more effectively alleviating distress associated with these. Analyses revealed that Actaware, Nonjudge and Nonreact were found to have incremental validity in predicting psychological symptoms, suggesting that prioritising the development of these particular elements of mindfulness may yield positive results in the treatment of psychological symptoms.

Of existing mindfulness measures, the FFMQ arguably presents the most advantageously comprehensive and detailed account of mindfulness. Furthermore, the process of establishing reliability and

validity of the FFMQ outlined above indicates that it possesses reasonable psychometric properties and may therefore be used with some confidence in research studying mindfulness. A further advantage of the FFMQ is that it measures mindfulness in daily life and doesn't require experience with meditation. A number of the other measures are potentially restricted by their focus on specific populations or dependence on experience of meditation, and consequently not designed for general use. Moreover, the multifaceted nature of the questionnaire allows for more accurate measurement of the relationship between key elements of mindfulness and related constructs. Without this facility, the true relationship between mindfulness and other important constructs may be misrepresented by some components of mindfulness exaggerating or minimising the significance of the relationship. For example, the relationship between self-compassion and the Nonreact facet may be strong yet overall be measured as weak to moderate due to a weak relationship with other facets. A multifaceted approach to defining mindfulness means that regression analyses and incremental validity testing become possible, allowing further detail about the specific nature and primacy of important relationships. Therefore, having a questionnaire that defines mindfulness as multifaceted allows for more detailed and accurate measurement of what may be occurring between this and other relevant constructs, as well as providing a more detailed, comprehensive and measureable interpretation of mindfulness itself. Furthermore, exploratory factor analyses during the construction of the FFMQ highlighted the possibility that numerous items from previous

questionnaires contained elements overlapping with more than one facet, suggesting that they too are actually multifaceted. Clarifying the nature of mindfulness within existing questionnaires potentially allows for a more precise understanding of this concept to emerge in the form of the FFMQ.

Despite the apparent advantages of this measure there exist numerous criticisms of this, potentially limiting its value as a measure of mindfulness. For example, alongside the KIMS the FFMQ is the longest questionnaire, containing potentially confusing concepts to those unfamiliar with mindfulness or without high level cognitive skills, leading to the possibility of random errors. This is less likely to have been identified through testing on samples of highly educated psychology students familiar with thinking in abstract terms, but may be apparent in clinical populations with potentially impaired concentration, memory and cognitive deficits. Indeed, the samples used to conduct psychometric testing were distinctly dissimilar to a population most likely to be recommended mindfulness-based interventions within current health guidelines. As with all mindfulness measures the FFMQ relies on the participant's ability to recall moments of being mindful and to recognise these events as they occur. The MAAS attempts to offset this problem by reverse scoring all items, proposing that mindlessness is our more usual state and consequently more readily identified. The FFMQ uses instead a mix of reverse and normal scoring. The ability to describe experience appears less explicit in all other mindfulness measures, except for the

KIMS. Whilst directions to label internal and external phenomena are included within mindfulness meditation instructions, for example in MBCT, this skill does not appear to constitute a central element. Its inclusion, and that of the other facets is likely to be heavily influenced by the pooling of items from the KIMS, which has significantly more items than other measures, comprising over one third of total pooled items. It is therefore unsurprising that the facet structure derived from this process included all of those within the KIMS. The FFMQ may not therefore be regarded as a new definition of mindfulness but rather an extension of the KIMS; 24 of the final 39 items are taken from this. This may also reflect the author's interests and form a source of potential bias as both the KIMS and the FFMQ have the same principal author, Ruth Baer. The authors of the KIMS comment that the items included within this are derived from a conceptualisation of mindfulness captured within Dialectical Behaviour Therapy (DBT: Baer et al., 2004), and this may explain the inclusion of the facet Describe both within the KIMS and therefore the FFMQ. A definition of mindfulness arising from this may therefore not be as inclusive in its scope as it initially appears, predominantly reflecting only one recently developed theoretical and philosophical position; DBT.

Acceptance is not included as a specific facet despite appearing a central component of the construct of mindfulness and its inclusion within other mindfulness measures. Acceptance items pooled in the construction of the FFMQ were found in exploratory factor analyses to

load onto more than one factor and consequently were not included. The authors posit that the facets Nonjudge and Nonreact constitute the operationalisation of acceptance and thus argue that this important component is captured within this definition. The ability to respond to phenomena without judgment or reaction may be linked to a capacity for self-compassion. This capacity is increasingly linked to positive outcomes from MBCT and other mindfulness based interventions (e.g. Shapiro et al., 2005; Lykins & Baer, 2009; Kuyken et al., 2010). However, it is not included within any mindfulness questionnaires, including the FFMQ. Whilst it may be argued that heightened self-compassion is a consequence of mindfulness rather than a component of it, it is unlikely that many mindfulness teachers would advocate attempting mindfulness without a compassionate stance, and directions to be 'kindly' and 'gentle' when attempting mindfulness are commonly used due to the emotional challenges this can involve (Segal et al., 2013). Indeed, a compassionate attitude is embodied within mindfulness teaching (Kabat-Zinn, 1990) and considered an integral and necessary feature within Buddhist mindfulness (Kumar, 2002). Its absence within mindfulness measures may therefore limit the validity of any such conceptualisations. This apparent anomaly is further illustrated by the inclusion of mindfulness as a subscale of the self-compassion scale (Neff, 2003a).

In summary, there are a number of available mindfulness questionnaires which aim to capture this construct and measure levels of this within

responders. Whilst there are a number of limitations inherent within the measure, the FFMQ is considered the most comprehensive currently used mindfulness questionnaire, amalgamating the most relevant items from pre-existing measures and conceptualising mindfulness as a multi-faceted construct. Whilst it has promising psychometric properties and a number of studies describe its use with a range of populations, it is less clear if its reliability and validity have been investigated with alternative samples, including those with depression. Given the increasing use of mindfulness-based cognitive therapy in the treatment of depression, it would be advantageous to identify if the FFMQ is able to accurately measure levels of mindfulness in a population likely to experience this as part of psychological interventions in health services.

2.5 Psychometric properties of the FFMQ

Despite some exceptions (Manicavasgar et al., 2012; Brown & Ryan, 2003), studies to date demonstrate that mindfulness-based interventions lead to increased levels of mindfulness in participants and this tends to be associated with heightened levels of wellbeing (Schroevers & Brandsma, 2010; Shapiro et al., 2011; Nyklicek & Kuijpers, 2008; Birnie et al., 2010; Moore & Malinowski, 2009; Chambers et al., 2008; Frewen et al., 2008; Deyo et al., 2009; Shahar et al., 2010; Harnet et al., 2010; Ree & Craige, 2007; Buchheld et al., 2001; Walach et al., 2006; Lau et al., 2006; Eisendrath et al., 2008; Michalak et al., 2008; Semple, 2010). Mindfulness may consequently be regarded as a desirable quality to develop, particularly for people with emotional and mental health

problems. However, whilst the FFMQ may be regarded as the most comprehensive construct of mindfulness in current use as described above, thus far it is unclear whether the psychometric properties of this measure have been tested to determine its ability to accurately capture this construct in a depressed population. To clarify the psychometric robustness of the FFMQ in depressive disorder a more systematic approach was taken to identify key literature in this area, and to establish its uses in samples to date, including those with diagnosable depressive disorders.

Early literature searches carried out between 2009-2012 included only the keyword 'mindfulness' with up to 2500 papers being identified. Titles, abstracts, reference lists and full texts were reviewed to clarify whether the FFMQ was used in each study. Articles that clearly would not include any use of a mindfulness measure such as book reviews were not explored beyond the title. The majority of articles however, were examined further, initially identifying whether the FFMQ was referenced in the complete reference list. If cited, or if the reference list was not included in the search database (e.g., Psychinfo) the abstract was reviewed to ascertain if levels of mindfulness were assessed in the study. Where this was the case the full text was then briefly reviewed to identify the mindfulness measure used in the study in order to identify if the FFMQ had been included. From 2012 onwards however, the number of papers focusing on mindfulness increased substantially as the popularity and interest in mindfulness expanded, and using the keyword

'mindfulness' resulted in approximately 6500 papers making the previous search strategy impractical. Consequently a different strategy of searching the literature to identify relevant papers was adopted. This initially involved using several keywords including 'five facets mindfulness questionnaire' in an attempt to more precisely identify articles relating to levels of mindfulness as measured via the FFMQ in study participants, but only resulted in a very small number of studies being highlighted. A more comprehensive search was subsequently conducted to clarify existing literature focusing on mindfulness as captured by the FFMQ. The keywords 'mindfulness' AND 'measurement' OR 'dispositional' OR 'trait' OR 'facets' OR 'psychometrics/reliability/validity' were used. All studies focusing on mindfulness and its measurement via the FFMQ should include these keywords in the title or abstract. Those which additionally focus on depression should be contained within these. Online search engines included Scencedirect, Psychinfo, Medline, PubMed and Google Scholar. The final literature search was conducted between 23.10.2015 and 26.10.2015, and included literature dating back to 2006, when the FFMQ was developed. Studies identified through the literature search that did not utilise the FFMQ were nevertheless reviewed to ascertain whether they referred to this, or discussed its uses, psychometric properties etc, in order to ensure that all uses of the FFMQ in published papers were identified by the author.

The literature search also included contacting Ruth Baer, author of the FFMQ and Mark Williams, the leading mindfulness and depression researcher in the UK and co-creator of mindfulness-based cognitive therapy. Both confirmed that they are unaware of the FFMQ having been used in a sample with moderate to severe depression.

A total of 261 studies were identified which have used the FFMQ as a measure of dispositional mindfulness since its creation in 2006. However, over half of these (158) did not evaluate the psychometric properties of the FFMQ or measure depressive symptomatology, focusing instead on a diverse range of alternative topics, including other mental health problems such as anxiety (Hoge et al., 2015; Thompson & Waltz, 2010; Basharpour et al., 2015); bipolar (Ives-Deliperi et al., 2013) and personality disorders (Elices et al., 2015; Fossati et al., 2012; McClintock et al., 2015; O'Toole et al., 2012; Sinclair & Feigenbaum, 2012). As this review focuses on clarifying the extent to which the psychometric properties of the FFMQ have been established in depressive disorders, only studies using the FFMQ which also either investigated its reliability and validity or measured depressive symptomatology are included in this. These are summarised in table 6.

Table 6. Studies utilising the FFMQ as a measure of mindfulness

FFMQ studies	n=103
<ul style="list-style-type: none"> • Studies including the FFMQ and a measure of depressive symptomatology <i>with non-depressed samples</i> 	39
<ul style="list-style-type: none"> • Studies including the FFMQ and a measure of depressive symptomatology <i>with depressive symptoms secondary to another health problem</i> 	22
<ul style="list-style-type: none"> • Studies including the FFMQ and a measure of depressive symptomatology <i>with depression as the primary health problem</i> 	14
<ul style="list-style-type: none"> • Studies investigating the FFMQ and its psychometric properties <i>in non-clinical samples</i> 	24
<ul style="list-style-type: none"> • Studies investigating the psychometric properties of the FFMQ <i>in clinical samples, including those with depression</i> 	4

Studies utilising the FFMQ and a measure of depressive symptomatology are included in tables 7 to 11 below. These identify the authors, study participants, design, measures of depression and other constructs identified as important in understanding the role of mindfulness in depression (self-compassion, experiential avoidance and rumination) and key findings in relation to the FFMQ and depression. This begins by focusing on studies using samples of non-depressed participants.

2.5.1 The FFMQ and a measure of depressive symptomatology with non-depressed samples

Table 7. Studies including the FFMQ and a measure of depressive symptomatology with non-depressed samples

Authors	Title	Study sample	Study design	Key measures	Key findings
Barnes & Lynn (2010)	Mindfulness skills and depressive symptoms: A longitudinal study	Psychology students (n=102)	Longitudinal study of depression and mindfulness skills utilising questionnaires. Self-report measures completed at 3 time points over 15 weeks	FFMQ BDI-II	Actaware, Nonreact & Nonjudge inversely related to depression Observe positively related at T1 & T2 to depression Describe had no relationship with depression High Observe correlated with high depression only when person low in

					Nonreact. Authors conclude that Nonreactivity is protective of depression
Barnhofer, Duggan & Griffith (2011)	Dispositional mindfulness moderates the relationship between neuroticism and depressive symptoms	Community sample from southwest UK (n=144)	Questionnaire based study focusing on the relationship between neuroticism, depression and mindfulness. Self-report measures completed over 7 years for analysis of correlations and moderators	FFMQ BDI-II	Neuroticism predicts depression over time and mindfulness moderates this relationship: The higher the mindfulness the weaker the relationship between neuroticism and depression
Benn, Akiva,	Mindfulness	Parents and	RCT of 5 week	FFMQ	Intervention group had

Arel & Roeser (2012)	Training Effects for Parents and Educators of Children With Special Needs	educators of children with special needs (n=52)	mindfulness training for parents and educators of children with special needs Versus wait list controls group	CES-D SCS	increased mindfulness post intervention Significant post intervention reduction in depression not maintained at 2 month follow-up
Branstrom, Duncan & Moskowitz (2011)	The association between dispositional mindfulness, psychological well- being, and perceived health in a Swedish population-based	Community sample (n=382)	A cross-sectional study examining the association of mindfulness with depression, anxiety, positive states of mind (PSOM), and perceived health. Study also involved	FFMQ HADS	Actaware & Nonreact were strongly inversely related to depression Nonjudge, Actaware & Nonreact moderated the effect of depression and perceived health and stress

	sample		tests of the moderating role of mindfulness in these variables		
Brooker, Julian, Webber, Chan Shawyer & Meadows (2013)	Evaluation of an Occupational Mindfulness Program for Staff Employed in the Disability Sector in Australia	Staff working in disability services (n=34)	Longitudinal observational design of mindfulness training utilising questionnaires pre-post intervention	FFMQ DASS-21 SCS	Observe facet increased significantly post-intervention. No change in any other mindfulness facets or depressive symptoms
Brown, Bravo, Roos & Pearson (2015)	Five Facets of Mindfulness and Psychological Health: Evaluating a Psychological	Psychology students (n=944)	Questionnaire based study conducting mediational analyses of the relationship between psychological	FFMQ CES-D	Nonjudge, Actaware & Nonreact correlated negatively with depression

	Model of the Mechanisms of Mindfulness		health and mindfulness		
Brown-Iannuzzi, Adair, Payne, Richman & Fredrickson (2014)	Discrimination hurts, but mindfulness may help: trait mindfulness moderates the relationship between discrimination and depressive symptoms	Community sample (n=624)	Completion of online survey investigating the relationship between discrimination and depression	FFMQ BDI	Mindfulness moderated the relationship between discrimination and depressive symptoms indicating that mindfulness protects from depressive symptoms in those experiencing discrimination
Cash &	What Facets of	Participants	Participants completed	FFMQ	A higher degree of

Whittingham (2010)	Mindfulness Contribute to Psychological Well-being and Depressive, Anxious, and Stress-related Symptomatology?	were recruited from meditation organizations (Vipassana and Zen) as well as undergraduate psychology students (n=106)	online questionnaires to explore which of the FFMQ facets predict psychological well- being and symptoms of depression, anxiety, and stress using regression analyses	DASS	Nonjudge & Actaware were found to predict lower levels of depressive symptomatology
Cavanagh, Strauss, Cicconi, Griffiths & Wyper (2013)	A randomised controlled trial of a brief online mindfulness-based intervention	University students (n=104)	RCT of short mindfulness training delivered via the internet Versus wait list control group	FFMQ PHQ-4	Significantly increased mindfulness and decreased depressive symptoms found in the intervention group

Coffey, Hartman, Fredrickson (2010)	Deconstructing Mindfulness and Constructing Mental Health: Understanding Mindfulness and its Mechanisms of Action	Study 1. University students (n=399) Study 2. University students (n=413)	Two questionnaire based studies examining how mindfulness & emotion regulation influence mental health via EFA, CFA and correlational analyses	FFMQ BSI	Study 1 factor analyses revealed substantial overlap between terms mindfulness and emotion regulation Study 2: Clarity about one's internal life, the ability to manage negative emotions, non-attachment and rumination were confirmed as mediators in the relationship between mindfulness and mental health
Cowdrey & Park (2012)	The role of experiential	Mentally healthy female university	Completion of online questionnaires for	FFMQ PHQ9	A negative and statistically significant relationship

	avoidance, rumination and mindfulness in people with eating disorders	students (n=228)	correlational & hierarchical regression analyses of relationship between experiential avoidance, rumination, depression and mindfulness	RRS-ED AAQ-II	between mindfulness and depression was found
Erisman & Roemer (2012)	A Preliminary Investigation of the Process of Mindfulness	Study 1. University students (n=410) Study 2. A subset from study 1 enrolled	Methodological studies examining the reliability and validity of the newly developed Mindfulness Process Questionnaire (MPQ)	FFMQ DASS-21	Study 1. MPQ has internal reliability indicated by Cronbach's alpha scores in excess of 0.70 (0.71) MPQ a significant predictor of depression Study 2. Change in MPQ

		in Acceptance Based Behavioural Therapy or Applied Relaxation			scores from pre- to posttreatment were significantly correlated with change in depression
Frewen , Lundberg, MacKinley & Wrath (2011)	Assessment of Response to Mindfulness Meditation: Meditation Breath Attention Scores in Association with Subjective Measures of State and Trait	Study 1. University students (n=100) Study 2. University students	Methodological studies testing the validity of the Meditation Breath Attention Scale (MBAS)	FFMQ ATQ-8	Study findings produced mixed support for the construct validity of the MBAS. This did not correlate with other measures of mindfulness as predicted. Only in study 2 did the MBAS correlate with the FFMQ facet Actaware

	Mindfulness and Difficulty Letting Go of Depressive Cognition	(n=74)				Trait mindfulness is associated with less difficulty letting go of depressive cognition Measures of state mindfulness were unrelated to difficulty in letting go of depressive cognition
Gilbert, McEwan, Gibbons, Chotai, Duarte & Matos (2012)	Fears of compassion and happiness in relation to alexithymia, mindfulness, and self-criticism	University students (n=185)	Methodological study in development of 'fear of happiness' scale	FFMQ DASS SCS		Depression most strongly linked to Nonjudge

Hamill, Pickett, Amsbaugh & Aho (2015)	Mindfulness and acceptance in relation to Behavioural Inhibition System sensitivity and psychological distress	Psychology students (n=467)	Questionnaire based study examining the relationship between mindfulness, acceptance, behavioural inhibition system sensitivity and psychological distress	FFMQ DASS AAQ	Depression correlated negatively with all facets except Observe
Hindman, Glass, Arnkoff & Maron (2015)	A Comparison of Formal and Informal Mindfulness Programs for Stress Reduction in University	University students (n=34)	RCT comparing a 6 week mindfulness training that was either formally taught or informally taught with a wait list control group	FFMQ DASS SCS AAQ-II	Both groups experienced increases in mindfulness and improvements in depressive symptoms compared to the wait list control group

	Students				Participants taught mindfulness skills formally had greater degree of improvement
Jennings, Frank, Snowberg, Coccia & Greenberg (2013)	Improving Classroom Learning Environments by Cultivating Awareness and Resilience in Education (CARE): Results of a Randomized Controlled Trial	State teachers in the U.S. (n=50)	RCT examining the efficacy of a mindfulness training programme for teachers versus wait-list control group	FFMQ CES-D	Significant increase following mindfulness training for the facets Observe and Nonreact Significant reduction in depressive symptoms following mindfulness training

Jones, Hastings, Totsika, Keane, & Rhule (2014)	Child Behavior Problems and Parental Well- Being in Families of Children With Autism: The Mediating Role of Mindfulness and Acceptance	Parents of children with autism (n=71)	Questionnaire based study exploring mediators in the relationship between parental well-being, mindfulness and acceptance via correlational & regression analyses	FFMQ HADS AAQ-II	Mindfulness acted as a significant mediator for levels of depression
Josefsson, Lindwall & Broberg (2014)	The Effects of a Short-term Mindfulness Based Intervention on Self-reported Mindfulness, Decentering,	Hospital staff (n=86)	RCT comparing 4 week mindfulness training course with relaxation training and inactive wait list control group	FFMQ HADS	Mindfulness training led to increased mindfulness scores compared to other groups No significant difference between the mindfulness

	Executive Attention, Psychological Health, and Coping Style: Examining Unique Mindfulness Effects and Mediators				training, relaxation or waitlist control group on scores of depression
Laurent, Laurent, Hertz, Egan-Wright & Granger (2013)	Sex-specific effects of mindfulness on romantic partners cortisol responses to conflict and relations with psychological	Heterosexual couples (n=100 couples)	Questionnaire based study involving completion of measures of mindfulness and related constructs and provision of a cortisol	FFMQ CES-D	Nonjudge, Actaware, Describe and Nonreact all related negatively to depressive symptoms Whereas the facet Nonreact predicted higher conflict

	adjustment		sample before and after a conflict discussion task.		stress cortisol levels in women, in men, the facet
			Hierarchical linear regression used to assess relationship between variables		Describe predicted reduced cortisol reactivity. These patterns were related to better adjustment – less depression for women and greater wellbeing for men
Lavender, Gratz & Tull (2011)	Exploring the Relationship between Facets of Mindfulness and Eating Pathology in Women	Undergraduate women (n=276)	Questionnaire based study exploring relationship between eating pathology and mindfulness using hierarchical regression analysis	FFMQ DASS	Actaware & Nonjudge had the highest correlations with depression. Observe had no relationship at all

Lykins & Baer (2009)	Psychological Functioning in a Sample of Long- Term Practitioners of Mindfulness Meditation	Long-term meditators and demographically similar nonmeditators (n=260)	Questionnaire based study examining correlations/mediators between mindfulness and related variables	FFMQ DASS	Extent of meditation experience was correlated in the expected directions with levels of mindfulness and with many other variables Mean differences between meditators and nonmeditators were significant in most cases Mediation analyses were consistent with the hypothesis that practicing meditation is associated with increased mindfulness
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Lykins, Baer & Gottlob (2012)	Performance-Based Tests of Attention and Memory in Long-Term Mindfulness Meditators and Demographically Matched Nonmeditators	Adults with a long-term mindfulness meditation practice compared with a demographically matched sample of nonmeditators (n=33)	Adults with a long-term mindfulness meditation practice were compared with a demographically matched sample of nonmeditators on several widely used tests of attention and memory functioning	FFMQ DASS	in daily life, which is related to decreased rumination, decreased fear of emotion, and increased behavioural self-regulation. Whilst the meditating group had higher levels of mindfulness than the non-meditating group, there was no difference in depressive symptoms between these
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MacKenzie & Kocovski (2010)	Self-Reported Acceptance of Social Anxiety Symptoms: Development and Validation of the Social Anxiety - Acceptance and Action Questionnaire	University students (n=339)	Methodological study validating the SA-AAQ	FFMQ BDI-II	Results indicated that the SA-AAQ has good internal consistency and good convergent and divergent validity
Miyata, Okanoya & Kawai (2015)	Mindfulness and Psychological Status of Japanese Yoga Practitioners: a Cross-Sectional	Yoga practitioners versus control group	Questionnaire based study using correlational analyses to examine relationships between	FFMQ BDI	Yoga practitioners reported significantly higher FFMQ scores than the control participants for the total scores and the three out of

	Study	(n=166)	mindfulness and psychological wellbeing		the five facets: Observe, Describe & Nonreact Level of depressive symptomatology was significantly lower for yoga practitioners than for the non-practitioners
Parkin, Morgan, Rosselli, Howard, Sheppard, Evans, Hawkins, Martinelli, Golden,	Exploring the Relationship Between Mindfulness and Cardiac Perception	Studies 1 & 2. Healthy adults (n=60) Study 3. Participants on an 8 week mindfulness	Series of studies utilising questionnaires, mindfulness practice and biological measurement to investigate the relationship between	FFMQ BDI-II	Meditation practice did not significantly alter cardiac perception accuracy following week long or 8 week mindfulness practice Eight-week (but not 1 week) meditation practice led to an

Dalgleish &
Dunn (2014)

course
(n=17)

mindfulness and
accuracy of cardiac
perception

Study 4.

Samples pooled
from studies 1-3
and from other
studies
(n=165)

increase in confidence in
cardiac perception
judgements

The facet Observe related to
weakening coherence
between accuracy and
confidence estimates, whilst
the remaining FFMQ facets
were related to increasing
coherence between
accuracy and confidence
estimates

The 8 week mindfulness
course was associated with
significant increases in

					mindfulness and reductions in depressive symptoms. Shorter mindfulness exercises were not
Pearson, Brown, Bravo & Witkiewitz (2015a)	Staying in the Moment and Finding Purpose: The Associations of Trait Mindfulness, Decentering, and Purpose in Life with Depressive Symptoms, Anxiety Symptoms, and Alcohol-Related	Psychology students (n=1,277)	Questionnaire based study examining mediators between mindfulness, decentering, alcohol, purpose in life and depressive and anxiety symptoms	FFMQ CESD-R	Relationship between mindfulness and depression partially mediated by 'Decentering' and 'Purpose in Life'

	Problems				
Pearson, Lawless, Brown & Bravo (2015b)	Mindfulness and emotional outcomes: Identifying subgroups of college students using latent profile analysis	Psychology students (n=663)	Questionnaire based study exploring patterns of responding to FFMQ using latent profile analysis	FFMQ CESD-R	Categorises participants as falling into categories where responses characterised as: 'Judgementally Observing Group': High on Observe but low on Nonjudge and Actaware 'High Mindfulness group': High scores across all facets 'Nonjudgmentally Aware Group': High on Nonjudge

and Actaware but low on
Observe

'Low Mindfulness Group':
Low on all facets

'High mindfulness' and
'Nonjudgmentally Aware'
groups had lowest rates of
depressive symptomatology.
Those categorised as 'Low
Mindfulness' had more
depressive symptomatology
but those classified as the
'Judgmentally Observing
Group' consistently had the
highest rates of these

Perez-Blasco, Viguier & Rodrigo (2013)	Effects of a mindfulness-based intervention on psychological distress, well-being, and maternal self-efficacy in breast-feeding mothers: results of a pilot study	Breast-feeding mothers (n=26)	RCT comparing mindfulness training to no intervention control group	FFMQ DASS-21 SCS	Compared to the control group, mothers in the treatment group scored significantly higher on maternal self-efficacy, some dimensions of mindfulness (observing, acting with awareness, non-judging, and non-reactivity), and self-compassion No difference between groups in levels of depressive symptoms post intervention
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Peters, Erisman, Upton, Baer & Roemer (2011)	A Preliminary Investigation of the Relationships Between Dispositional Mindfulness and Impulsivity	University students Study 1 (n=347) Study 2 (n=227)	Questionnaire based studies examining the correlational relationships between self-reported mindfulness and impulsivity	FFMQ DASS	The facet Actaware had some of the strongest relationships to impulsivity, and these correlations generally persisted independently of trait-level negative affect or current general distress Findings suggest that increased awareness of ongoing activity may promote better regulation of behaviour even when negative affect or distress is present
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					The nonjudging facet of mindfulness may also contribute to reduced negative urgency and increased perseverance, and the nonreactivity facet may contribute to reduced negative urgency and increased premeditation
Petrocchi & Ottaviani (2015)	Mindfulness facets distinctively predict depressive symptoms after two years: The mediating role of rumination	University staff and students (n=41)	Longitudinal questionnaire based study of changes in mindfulness, depression and rumination over two years	FFMQ CES-D RRS	Nonjudge appeared to protect from depression at time 1 Rumination mediated impact of Nonjudge at time 2

					Results highlight the potentially important role of Nonjudge in wellbeing
					Test-retest reliability supported over 20 months for all facets except Observe
Raphiphatthana, Jose & Kielpikowski (2015)	How do the facets of mindfulness predict the constructs of depression and anxiety as seen through the lens of the tripartite theory	University students Study 1. (n=285) Study 2: (n=228)	An online survey was completed once in a cross sectional study and twice with a four week interval in a longitudinal study including self-report measures of mindfulness,	FFMQ CES-D	Nonjudge & Actaware predicted lower levels of hyperarousal, negative affect and anhedonia Observe only predicted higher levels of hyperarousal

			depression and anxiety		Describe was unrelated to all elements of the tripartite theory
Rimes & Wingrove (2011)	Pilot study of mindfulness-based cognitive therapy for trainee clinical psychologists	Trainee clinical psychologists (n=20)	Pre/post questionnaire based intervention study evaluating the impact of MBCT on mindfulness, depression, stress, self-compassion and rumination	FFMQ HADS SCS	Significant increases following MBCT in mindfulness & self-compassion Significant decrease in rumination No significant reduction in depression
Short & Mazmanian	Perfectionism and repetitive negative	University students	Questionnaire based study examining	FFMQ RRS-B	Students in the high mindfulness group reported

(2013)	thoughts: Examining a multiple mediator model in relation to mindfulness (n=213)		mediators of the relationship between perfectionism, psychological distress and mindfulness	DASS-21	lower levels of depression Nonjudge, Actaware and to a lesser degree Nonreact were the strongest independent contributors to perfectionism
Short, Mazmanian, Oinonen & Mushquash (2015)	Executive function and self-regulation mediate dispositional mindfulness and well-being (n=77)	University students	Multi-method design using self-report measures and performance tasks to examine mediators in relationship between self-regulation, executive functioning and mindfulness	FFMQ DASS-21	Nonjudge & Actaware correlated in expected directions with depression Findings suggest that when people have high mindfulness, experiences of positive affect are promoted by self-regulation –

					<p>behaviours that include reinforcement when a goal is met. Both executive function and self-regulation may be important in terms of protecting from negative affect. Nonjudge & Actaware are most strongly associated with these features.</p>
<p>Soysa & Wilcomb (2013)</p>	<p>Mindfulness, Self-compassion, Self-efficacy, and Gender as Predictors of Depression,</p>	<p>University students (n=204)</p>	<p>Questionnaire based study examining relationships between mindfulness facets, self-compassion and depression using</p>	<p>FFMQ SCS DASS-21</p>	<p>Describing, Nonjudging, and Actaware inversely significantly predicted depression, in addition to Isolation and Self-judgment (negative self-compassion).</p>

	Anxiety, Stress, and Well-being			hierarchical regression analyses		Together these accounted for almost all of the predicted variance
Tucker, O'Keefe, Cole, Rhoades- Kerswill, Hollingsworth, Helle, DeShong, Mullins-Sweatt & Wingate (2015)	Mindfulness tempers the impact of personality on suicidal ideation	University students (n=315)	Questionnaire based study examining mediators and moderators in the relationship between mindfulness, personality facets and suicidality using hierarchical regression analyses	FFMQ HDSQ-SS	Mindfulness mediated the relationship between both high neuroticism and low extraversion and suicidal ideation	
Van Dam, Hobkirk,	How Does Mindfulness	Community sample just	RCT comparing a mindfulness training	FFMQ CES-D	Actaware showed significant group difference following	

Sheppard, Aviles-Andrews & Earleywine (2013)	Reduce Anxiety, Depression, and Stress? An Exploratory Examination of Change Processes in Wait-List Controlled Mindfulness Meditation Training	below clinical levels of depression (n=58)	and wait-list control group in a pre-post questionnaire based intervention study	SCS	mindfulness training. Nonjudge approached significance but did not reach this. Reduced depressive symptoms in mindfulness training group. SCS and emotional balance appeared to be the main helpful aspects arising from the programme rather than increases in mindfulness
Woodruff, Glass, Arnkoff, Crowley,	Comparing Self-Compassion, and Mindfulness, and	University students	Questionnaire based study examining relationship between	FFMQ BDI-SF SCS	Self-compassion total score (SCS) was superior to single-factor mindfulness

Hindman & Hirschhorn (2013)	Psychological Inflexibility as Predictors of Psychological Health	(n=147)	AAQ, SCS, mindfulness and psychological health using correlational and regression analyses	AAQ-II	<p>total score as a predictor of psychological health.</p> <p>However, ability of FFMQ to predict depressive symptomatology increased substantially when subscales used.</p> <p>Psychological inflexibility (AAQ-II) predicted greater variance than self-compassion for negative indicators of psychological health</p>
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FFMQ=Five Facets Mindfulness Questionnaire; SCS=Self-Compassion Scale; RRS=Rumination Responses Scale; RRS-B=Rumination Responses Scale-Brooding Subscale; RRS-ED=Rumination Responses Scale-Eating Disorder Version; AAQ=Acceptance and Action Questionnaire 1st Version; AAQ-II=Acceptance and Action Questionnaire 2nd Version; CES-D=Centre for Epidemiological Studies Depression Scale; CESD-R=Centre for Epidemiological Studies Depression Scale-Revised; DASS-21=Depression and Anxiety Symptom Scale; HADS=Hospital Anxiety and Depression Scale; BSI-18=Brief Symptom Inventory; BDI=Beck Depression Inventory; BDI=Beck Depression Inventory-1st Version; BDI-II=Beck Depression Inventory-2nd Version; BDI-SF=Beck Depression Inventory-Short Form; HDSQ-SS=Hopelessness Depression Symptom Questionnaire-Suicidality Subscale; ATQ-8=Short form of the Automatic Thoughts Questionnaire-Negative; PHQ-4=Patient Health Questionnaire-4 Items

*Studies including the FFMQ and a measure of depressive
symptomatology with non-depressed samples*

Studies included in table 7 included both intervention studies involving mindfulness training and studies investigating the relationship between mindfulness and related constructs using questionnaires and other methods of assessment. Whilst the majority of intervention studies in table 7 found that mindfulness training led to increased levels of mindfulness as measured across all facets of the FFMQ, some report that only a selection of individual facets were increased by mindfulness training. For example, Brooker and colleagues (Brooker et al., 2013) in their study providing occupational mindfulness training for 34 healthcare staff in Australia, reported that only the facet Observe significantly increased following this, despite this being of eight weeks duration. Another study (Van Dam et al., 2013) comparing mindfulness meditation training to a wait list control group for people with sub-clinical levels of depression (n=58) found that whilst scores on the facet Nonjudge were higher following mindfulness training, only the facet Actaware showed a significant increase. It therefore appears that whilst mindfulness training is likely to lead to a greater degree of this construct as measured by the FFMQ, there exists some variability in the degree and scope of this. These studies also included a measure of depressive symptomatology and findings relating to changes in this associated with mindfulness training are mixed. For example, several of these describe a reduction in depressive symptoms post intervention (Cavanagh et al., 2013; Hindman

et al., 2015; Sass et al., 2013; Van Dam et al., 2013), though improvements were not maintained at follow-up in the only study to measure this (Benn et al., 2012). Other studies found no change in levels of depression at all following mindfulness training (Josefsson et al., 2014; Brooker et al., 2013). Intervention studies investigating the impact of mindfulness training on non-depressed samples identified in table 7 above therefore indicate that whilst interventions designed to increase mindfulness appear to do so, this is not necessarily accompanied by a corresponding reduction in depressive symptomatology.

Additional studies involving non-depressed samples focused on the relationship between mindfulness and other constructs, including depressive symptoms, without attempting to influence this via a mindfulness-based intervention such as MBCT. These indicate that mindfulness and depression are inversely related to each other; those reporting a high level of mindfulness are likely to experience reduced levels of depressive symptoms compared to those scoring low on mindfulness. Studies exploring the mediating role of mindfulness in depressive symptomatology identify its impact on neuroticism and general depressive symptoms as measured by the BDI-II (Barnhofer et al., 2011) and the specific symptoms of suicidal ideation (Tucker et al., 2015). Mindfulness was also found to positively influence the relationship between perfectionism and depression (Short & Mazmanian, 2013) and appeared to protect those at risk of discrimination from the potential onset of depressive symptoms (Brown-Iannuzzi et al., 2014). Findings of

the impact of meditative practice on symptoms of depression are contrasting in the two studies to explore this. Comparisons of meditators with demographically matched non-meditators and yoga practitioners and healthy adults both found raised levels of mindfulness in the meditating and yoga practitioners as predicted. However, only the yoga practitioners had reduced levels of depressive symptomatology associated with this (Lykins et al., 2012; Miyata et al., 2015).

Facets most consistently demonstrating a significantly negative relationship with depressive symptoms are Nonjudge and Actaware (Cash & Whittingham., 2010; Lavender et al., 2011; Raphiphatthana et al., 2015; Short et al., 2015). The facet Nonjudge is further identified as being of particular importance in mitigating the impact of depressive features (Gilbert et al., 2012; Petrocchi & Ottaviani, 2015). Alongside Nonjudge and Actaware, Nonreact is also identified as inversely related to symptoms of depression (Barnes & Lynn., 2010; Branstrom et al., 2011; Brown et al., 2015; Short et al., 2013), and the ability to be nonreactive to experience is described in one study as especially protective of depression given that it appeared to offset the aggravating impact of high levels of the facet Observe, which was otherwise associated positively with depressive symptoms (Barnes & Lynn, 2010). The role of the facet Observe in the experience of depressive symptoms was also highlighted in a study which indicated that a heightened capacity for observation of experience was associated with high levels of depressive symptoms when combined with low scores on the facets

Nonjudge and Actaware (Pearson et al., 2015b). Other studies however report that the facet Observe is statistically unrelated to symptoms of depression (Hamil et al., 2015; Lavender et al., 2011; Raphiphatthana et al., 2015). The facet Describe is found to be mostly either unrelated or only weakly associated with depressive symptoms with the exception of one study which found that Describe alongside Nonjudge and Actaware was a significant predictor of depressive features (Soysa & Wilcomb, 2013).

The only study to examine test-retest reliability of the FFMQ report that this was supported over a 20 month period for all facets except Observe (Petrocchi & Ottaviani, 2015).

Overall, studies focusing on mindfulness and depressive symptoms in non-depressed samples highlighted in table 7 above consistently indicate that the relationship between mindfulness and depression is typified by an inverse correlation; no studies report high levels of mindfulness with simultaneously high levels of depression. The facets that are most strongly inversely associated with depressive symptoms are Nonjudge, Actaware and Nonreact. When low scores for these facets are accompanied by high levels of Observe the likelihood of depressive symptoms increases.

Studies listed in table 7 above were predominantly carried out with samples of university students, often studying psychology, with an

average age of early to mid-twenties. Samples more representative of a depressed population are included in studies summarised in table 8 below which measure mindfulness and depressive symptoms in participants experiencing a diagnosable health problem.

2.5.2 Mindfulness and depressive symptoms in participants with depressive symptoms secondary to another health problem

Table 8. Studies exploring mindfulness and depressive symptoms in participants with depressive symptoms secondary to another health problem

Authors	Title	Study sample	Study design	Key measures	Key findings
Bränström, Kvillemo, Brandberg & Moskowitz (2010)	Self-report Mindfulness as a Mediator of Psychological Well-being in a Stress Reduction Intervention for Cancer Patients — A Randomized	Participants with previous diagnosis of cancer (n=71)	RCT of MBSR Versus wait list control group using self-report questionnaires	FFMQ HADS	Only MBSR group had increased mindfulness No significant effect of the mindfulness training on depressive symptoms immediately post intervention (or at 6 month follow-up: Bränström et al., 2012)

	Study				
Brotto & Basson (2015)	Group mindfulness based therapy significantly improves sexual desire in women	Women seeking treatment for sexual desire and/or arousal concerns (n=117)	Wait-list controlled intervention study investigating the impact of mindfulness training on sexual arousal/functioning. Self-report measures completed at pre/post intervention and 6 month follow up	FFMQ BDI	Improvements in sexual desire following mindfulness training were predicted by changes in the facet Describe, depressive symptoms and marginally by the facet Nonreact
Carmody & Baer (2008)	Relationships between mindfulness practice and	Participants with a range of diagnoses attending MBSR	Intervention study using self-report measures and diaries of amount of time spent	FFMQ BSI	Mindfulness training led to increased mindfulness and decreased depressive symptoms

	levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program	programme (n=174)	on home practice to investigate the relationship between mindfulness and psychological wellbeing in people undergoing mindfulness training		Time spent engaging in home practice of formal meditation exercises was significantly related to extent of improvement in most facets of mindfulness (all except Describe) and several measures of symptoms and well-being Increases in mindfulness were found to mediate the relationships between formal mindfulness practice and improvements in psychological functioning
Carmody, Baer, Lykins & Olendzki	An Empirical Study of the Mechanisms of	Participants reported a wide range of	Questionnaire based intervention study to examine factors	FFMQ BSI	Significant increase in all FFMQ facets following mindfulness training accompanied by

(2009)	Mindfulness in a Mindfulness-Based Stress Reduction Program	problems including illness related stress, chronic pain, anxiety, and personal and employment-related stress (n=320)	mediating the relationship between mindfulness and related constructs		significant increase and reperceiving/decentring and improvement in depression and anxiety However, no evidence that proposed mediators responsible for improvement
Cowdrey, Stewart, Roberts & Park (2013)	Rumination and modes of processing around mealtimes in women with	Women with a history of Anorexia Nervosa (AN) (n=37)	A mixed methods exploratory pilot study investigating the impact of mindful breathing, ruminating and distraction on eating	FFMQ BDI-II AAQ-II	Rumination exercise significantly more associated with analytical self-focus that mindful breathing exercise Theme arising from rumination

Anorexia	behaviours/processes	exercise: <i>Thinking about myself</i>
Nervosa:	in those with AN	
Qualitative and		Theme arising from mindful
quantitative		breathing exercise: <i>Being in the</i>
results from a		<i>moment; a pleasant distraction in</i>
pilot study		<i>a hectic day; increased awareness</i>
		<i>of food and eating</i>
		Theme arising from distraction
		exercise: <i>Not focusing on myself</i>
		Authors conclude that results
		highlight the difficulty in
		interrupting rumination and
		increasing self-acceptance in
		those with AN

Curtiss & Kiemanski (2014)	Teasing apart low mindfulness: Differentiating deficits in mindfulness and in psychological flexibility in predicting symptoms of generalized anxiety disorder and depression	Participants with a diagnosis of generalised anxiety disorder or depression (n=153)	Questionnaire based study conducted using hierarchical multiple regression analyses and mediation analyses to determine unique relationships between mindfulness, anxiety, depression and experiential avoidance	FFMQ BDI-II AAQ-II	All facets except for Observe were correlated negatively with depression Acting with awareness significantly mediated the relationship between psychological inflexibility and symptoms of depression. Therefore, the facet Actaware was more important in depression than experiential avoidance in determining level of depression
Desrosiers, Vine,	Mindfulness and emotion	Treatment seeking adults at	Self-report and assessor rated	FFMQ MASQ	Rumination and reappraisal significantly mediated associations

Klemanski & Nolen-Hoeksema (2013a)	regulation in depression and anxiety: common and distinct mechanisms of action	a mood and anxiety disorders clinic (n=187)	questionnaires based study using mediational analysis to explore proposed mechanisms of mindfulness on symptoms of depression and anxiety	RRS	between mindfulness and depressive symptoms Significant negative relationship between mindfulness and rumination and depression
Desrosiers, Klemanski & Nolen-Hoeksema (2013b)	Mapping mindfulness facets onto anxiety and depression	Treatment seeking adults at a mood and anxiety disorders clinic (n=187)	Self-report and assessor rated questionnaires based study to investigate associations between facets of mindfulness and dimension of depression and anxiety using correlational and	FFMQ MASQ	Nonjudge, Nonreact, Actaware and Describe were significantly inversely related to depressive symptoms Observe was unrelated to depressive symptoms

			regression analyses		
Desrosiers, Vine, Curtiss & Klemanski (2014)	Observing nonreactively: A conditional process model linking mindfulness facets, cognitive emotion regulation strategies, and depression and anxiety symptoms	Treatment seeking adults at a mood and anxiety disorders clinic (n=189)	Self-report and assessor rated questionnaires based study using mediation/moderators analysis to assess the relationship between mindfulness facets of Observe, Nonreact and depressive symptoms	FFMQ MASQ RRS	Nonreactivity significantly moderated the direct effect of observing on symptoms of depression Nonreactivity significantly moderated the indirect effect of observing on symptoms of depression through rumination and reappraisal
Garland,	Therapeutic	Females with	RCT comparing the	FFMQ	Mindfulness training was

Gaylord, Palsson, Faurot, Mann & Whitehead (2012)	mechanisms of a mindfulness- based treatment for IBS: effects on visceral sensitivity, catastrophizing, and affective processing of pain sensations	irritable bowel syndrome (IBS) (n=75)	impact of mindfulness training and social support group on symptoms of IBS. Analysis of factors mediating change conducted	BSI-18	associated with increases in the facet Nonreact. Additionally, increased nonreactivity was associated with decreased visceral sensitivity and pain catastrophizing Findings suggest that mindfulness training exerts significant therapeutic effects on IBS symptoms by promoting nonreactivity to gut-focused anxiety and catastrophic appraisals of the significance of abdominal sensations coupled with a refocusing of attention onto interoceptive data with less
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					emotional interference
Garland, Tamagawa, Todd, Specia, & Carlson (2013)	Increased Mindfulness Is Related to Improved Stress and Mood Following Participation in a Mindfulness- Based Stress Reduction Program in Individuals With Cancer	Participants with cancer (n=91)	Questionnaire based intervention study to examine the effect of participation in an MBSR program on levels of mindfulness, stress and mood	FFMQ POMS	Increases in mindfulness accounted for a significant percentage of the reductions in mood disturbance Nonjudge change score accounted for 14.8% of the change in total mood disturbance
Gillanders,	The	Studies involved	Methodological studies	FFMQ	Significantly negative relationship

Bolderston,	development	convenience	assessing the	CES-D	between the CFQ and the FFMQ
Bond,	and initial	samples of	psychometric	BDI-II	
Dempster,	validation of the	community adults	properties of the	HADS	
Flaxman,	cognitive fusion	(samples 1-3.	Cognitive Fusion	SCL-90	
Campbell,	questionnaire	n=1,281); mental	Questionnaire (CFQ)	AAQ-II	
Kerr,		health service			
Tansey,		users with a			
Noel,		broad range of			
Ferenbach,		mental health			
Masley,		problems			
Roach,		(sample 4.			
Lloyd, May,		n=215); people			
Clarke &		with multiple			
Remington (2014)		sclerosis (sample 5. n=133); people with current MDD, recovered			

		from MDD & no history of MDD (sample 6. n=75) and dementia carers (sample 7. n=219)			
Goldberg, Davis & Hoyt (2013)	The Role of Therapeutic Alliance in Mindfulness Interventions: Therapeutic Alliance in Mindfulness Training for Smokers	Adult smokers (n=37)	Questionnaire based intervention study investigating the impact of mindfulness training on relationship between therapeutic alliance and smoking outcomes	FFMQ DASS	Mindfulness training associated with increased mindfulness post intervention No changes in depression scores found post intervention

Heeren, Deplus, Peschard, Nef, Kotsou, Dierickx, Mondillon, Robinaugh & Philippot (2015)	Does Change in Self-reported Mindfulness Mediate the Clinical Benefits of Mindfulness Training? A Controlled Study Using the French Translation of the Five Facet Mindfulness Questionnaire	Participants were treatment seeking adults experiencing stress-related problems, illness, anxiety, and chronic pain (n=50)	Controlled intervention study of mindfulness training versus a wait- list control group to assess the impact on levels of mindfulness and psychological distress. Analysis of factors mediating change conducted	FFMQ BDI-II	Relative to a wait-list control, mindfulness training led to a change in self-reported mindfulness and psychological distress Changes in mindfulness mediated the effects of mindfulness training and a decrease in depression
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Kearney, McDermott, Malte, Martinez & Simpson (2012a)	Association of Participation in a Mindfulness Program With Measures of PTSD, Depression and Quality of Life in a Veteran Sample	Military veterans with a diagnosis of PTSD (n=92)	Questionnaire based intervention study examining the impact of MBSR on symptoms of posttraumatic stress disorder (PTSD), depression, functional status, behavioural activation, experiential avoidance, and mindfulness at baseline, and 2 and 6 months after enrolment	FFMQ PHQ9 AAQ	Veterans who took part in MBSR experienced significant improvements in measures of mental health, including measures of PTSD, depression, mindfulness and experiential avoidance The magnitude of change from baseline to 2 months (in the direction of clinical improvement for all scores) was maintained between the 2 month and 6 month time points for all measures
Kearney, Milton, Malte,	Participation in mindfulness- based stress	Military veterans with chronic health conditions	Uncontrolled questionnaire based intervention study	FFMQ PHQ9	Change in FFMQ scores correlated significantly with reduced depressive symptoms

McDermott,	reduction is not		examining the impact		
Martinez & Simpson (2012b)	associated with reductions in emotional eating or uncontrolled eating	(n=48)	of MBSR on eating behaviours at pre/post intervention and 4 month follow up		Enhanced mindfulness skills and reduced depressive symptoms were seen over time with moderate to large effect sizes
Kearney, Malte, McManus, Martinez, Felleman & Simpson (2013a)	Loving-Kindness Meditation for Posttraumatic Stress Disorder: A Pilot Study	Military veterans with a diagnosis of PTSD (n=42)	Questionnaire based intervention study of the impact of Loving Kindness meditation on depression, PTSD and self-compassion	FFMQ PROMIS SCS	Participants had increased levels of mindfulness post intervention Loving-kindness meditation was associated with reduced symptoms of PTSD and depression
					MBSR had no impact on emotional or uncontrolled eating

					Depression correlated most strongly with Nonreact but also with all other facets except Describe
					Self-compassion correlated highest with Actaware but also with all other facets except Describe
Kearney, McDermott, Malte, Martinez & Simpson (2013b)	Effects of Participation in a Mindfulness Program for Veterans With Posttraumatic Stress	Military veterans with a diagnosis of PTSD (n=47)	RCT of MBSR versus TAU examining the impact on symptoms of PTSD, depression, and mental health-related quality of life at baseline,	FFMQ PHQ9	No difference in levels of mindfulness or depressive symptoms between groups

	Disorder: A		posttreatment, and 4-		
	Randomized		month follow-up		
	Controlled Pilot				
	Study				
Kraemer, McLeish & Johnson (2015)	Associations between mindfulness and panic symptoms among young adults with asthma	Young adults with asthma (n=56)	Questionnaire based study involving completion of online self-report measures	FFMQ IDAS	The facet Actaware, relative to the other mindfulness skills, significantly predicted fewer panic symptoms and decreased anxiety sensitivity The facet Observe exhibited the opposite pattern of associations with the outcome variables compared to the other FFMQ subscales

Levin, Dalrymple, Himes & Zimmerman (2014)	Which facets of mindfulness are related to problematic eating among patients seeking bariatric surgery?	Participants seeking bariatric surgery (n=820)	Semi-structured diagnostic interviews and self-report measures completed to investigate factors mediating the relationship between mindfulness facets and eating behaviours	FFMQ CGI-S	High scoring on Actaware was consistently associated with lower levels of binge and emotional eating Observe was linked with more problematic eating The relationship between depression and emotional eating was mediated by mindfulness facets
Lovas & Barsky (2010)	Mindfulness-based cognitive therapy for hypochondriasi	Participants with health anxiety (n=10)	An uncontrolled questionnaire based pilot study evaluating the impact of MBCT on	FFMQ BDI-II	Significant increase in mindfulness found post intervention Significant reductions in

	s, or severe health anxiety: A pilot study		health anxiety		depressive symptoms maintained at 3 month follow up
Matchim, Armer & Stewart (2011)	Effects of Mindfulness-Based Stress Reduction (MBSR) on Health Among Breast Cancer Survivors	Women aged 18 years or older; diagnosed with Stage 0, I, or II breast cancer; with a minimum of 3 months after completing active treatment (n=36)	Controlled trial comparing mindfulness training to no intervention and evaluating impact on physiological and psychological outcomes	FFMQ POMS C-SOSI	Mindfulness training associated with increased mindfulness There was a decrease in mood disturbance scores within the intervention group though this was non-significant
McManus,	A Randomized	Participants with	RCT comparing MBCT	FFMQ	Increases in mindfulness following

Surawy, Muse, Vazquez-Montes & Williams (2012)	Clinical Trial of Mindfulness-Based Cognitive Therapy Versus Unrestricted Services for Health Anxiety (Hypochondrias)	health anxiety (n=74)	for health anxiety plus unrestricted services to unrestricted services alone. In addition to self-report measures completed pre/post intervention and at 12 month follow up, independent assessments of diagnostic status and assessor ratings of severity and distress were used	BDI-II	MBCT mediated improvements in health anxiety There was no significant advantage conferred by MBCT on symptoms of depression compared to control group, though both experienced reduced in symptoms post intervention and at 1 year follow up
Moskowitz, Duncan,	Dispositional mindfulness in	Participants with HIV	Questionnaire based study examining the		Depression inversely related to Nonjudge and Actaware but was

Moran, Acree, Espel, Kemeny, Hecht & Folkman (2015)	people with HIV: Associations with psychological and physical health	(n=175)	relationship between four facets of the FFMQ (Observe, Describe, Nonjudge, Actaware), stress and depression in a sample with HIV to identify mediating factors	unrelated to Observe and Describe.
Nakamura, Lipschitz, Landward, Kuhn & West (2011)	Two sessions of sleep- focused mind- body bridging improve self- reported symptoms of sleep and	Military veterans with a diagnosis of PTSD & sleep problems (n=63)	A pilot RCT comparing Mind-Body Bridging programme with control group of a sleep hygiene programme	Mind-Body Bridging programme led to improved sleep and PTSD symptoms and increased mindfulness compared to control group intervention No significant changes in depression found in either group

	PTSD in veterans: A pilot randomized controlled trial				
Price, Wells, Donovan & Rue (2012)	Mindful awareness in body-oriented therapy as an adjunct to women's substance use disorder treatment: A pilot feasibility study	Women with substance used disorders (n=46)	RCT repeated measure design comparing mindfulness training to TAU for relapse to substance use and health related outcomes	FFMQ BSI	Mindfulness training associated with nonsignificant increase in FFMQ scores post intervention Those completing mindfulness training had significantly less depressive symptoms and substance use days compared to TAU

Sachse, Keville & Feigenbaum (2011)	A feasibility study of mindfulness-based cognitive therapy for individuals with borderline personality disorder	Participants had diagnosis of borderline personality disorder (n=22)	A feasibility study utilising self-report questionnaires to evaluate the impact of MBCT on levels of mindfulness and psychological health	FFMQ BDI-II	No significant increase in mindfulness scores post treatment Treatment completers demonstrated significant improvement in depressive symptoms
Salmoirago-Blotcher, Crawford, Carmody, Rosenthal & Ockene (2011)	Characteristics of Dispositional Mindfulness in Patients With Severe Cardiac Disease	Outpatients with implantable cardioverter defibrillators who were naïve to mindfulness training	Questionnaire based study examining the relationship between mindfulness and psychological variables using correlational and regression analyses	FFMQ HADS	Mindfulness inversely associated with depression scores

		(n=30)			
Sass, Berenbaum & Abrams (2013)	Discomfort with Emotion Moderates Distress Reduction in a Brief Mindfulness Intervention	Adults with moderate levels of distress (N=24)	Questionnaire based intervention study investigating moderators of mindfulness	FFMQ BSI-18	Participants had reduced symptoms of distress/depression post intervention Discomfort with emotion moderated mindfulness treatment outcome
Schirda, Nicholas & Prakash (2015)	Examining Trait Mindfulness, Emotion Dysregulation, and Quality of Life in Multiple	Participants with multiple sclerosis with sub-clinical levels of depressive symptoms	An online survey using self-report measures of mindfulness, emotion dysregulation and quality of life. Analyses conducted to identify	FFMQ BDI-II	High levels of mindfulness were linked with increased quality of life and low levels of emotion dysregulation The authors conclude that low

	Sclerosis	(n=95)	moderators and mediators		emotion dysregulation may be the mediator the relationship between mindfulness and quality of life
Silverstein, Brown, Roth, Britton & Willoughby (2011)	Effects of mindfulness training on body awareness to sexual stimuli implications for female sexual dysfunctions	Women seeking treatment for sexual dysfunction (n=30)	Questionnaire based intervention study including meditation training versus an active control group to investigate the impact of mindfulness on interoceptive awareness and attention, self-judgment, and clinical symptoms	FFMQ BDI-II	Mindfulness training associated with improvements in facet Nonjudge and depressive symptoms Increased interoceptive awareness following mindfulness training

Soler, Valdeperez, Feliu-Soler, Pascual, Portella, Martin- Blanco, Alvarez & Perez (2012)	Effects of the dialectical behavioral therapy- mindfulness module on attention in patients with borderline personality disorder	Participants with a diagnosis of borderline personality disorder (n=60)	Non-randomized controlled trial comparing general psychiatric management plus DBT-mindfulness to general psychiatric management alone	FFMQ HRSD	Longer mindfulness practices were associated with reduced depressive symptoms and reduced levels of Nonreact
Tak, Hendrieckx, Nefs, Nycklicek, Speight &	The association between types of eating behaviour and dispositional	Adults with type 1 & 2 diabetes (n=634)	Online questionnaires completed to investigate the relationship between mindfulness facets and	FFMQ PHQ9	Actaware was the strongest predictor of both external and emotional eating behaviour, whereas for emotional eating, Describe and Nonjudge were also

Pouwer (2015)	mindfulness in adults with diabetes: Results from Diabetes MILES. The Netherlands		healthy eating patterns using correlational and regression analyses		predictive. Findings suggest that there is an association between dispositional mindfulness and eating behaviour in adults with type 1 or 2 diabetes
Van Ravesteijn, Lucassen, Bor, van Weel & Speckens (2013)	Mindfulness- based cognitive therapy for patients with medically unexplained symptoms: A randomized controlled trial	Participants presenting with medically unexplained symptoms (n=125)	RCT of MBCT Versus enhanced usual care. Questionnaires completed pre/post intervention and at 9 month follow up	FFMQ General health status qu	Increase in Observe and Describe found at 9 months follow up

Vollestad, Silvertsen & Hostmark Nielsen (2011)	Mindfulness- based stress reduction for patients with anxiety disorders: Evaluation in a randomised controlled trial	Participants with anxiety disorders (n=76)	RCT comparing the impact of mindfulness training versus wait list control group on anxiety and depressive symptoms	FFMQ BDI-II	Significant increase in mindfulness following mindfulness training Significant reduction in depressive symptoms for mindfulness training group Mindfulness training had large effect size for symptoms of depression compared to wait list
Zernicke, Campbell, Specia, McCabe- Ruff,	A Randomized Wait-List Controlled Trial of Feasibility and Efficacy of	Participants exhibiting moderate to high distress within 3 years of	RCT comparing MBCT for cancer versus wait list control group to evaluate the feasibility of an online	FFMQ POMS	There were significant improvements in the online MBCR group relative to controls for total scores of mood disturbance

Flowers & Carlson (2014)	an Online Mindfulness Based Cancer Recovery Program: The eTherapy for Cancer AppLying Mindfulness Trial	completing primary cancer treatment (n=62)	mindfulness programme for this population. Self-report measures completed pre/post intervention
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FFMQ=Five Facets Mindfulness Questionnaire; SCS=Self-Compassion Scale; AAQ=Acceptance and Action Questionnaire 1st Version; AAQ-II=Acceptance and Action Questionnaire 2nd Version; CES-D=Centre for Epidemiological Studies Depression Scale; PHQ-9=Patient Health Questionnaire-9 Items; DASS=Depression and Anxiety Symptom; DASS-21=Depression and Anxiety Symptom Scale-21 item version; HADS=Hospital Anxiety and Depression Scale; BSI=Brief Symptom Inventory; BSI-18=Brief Symptom Inventory-18 item version; BDI=Beck Depression Inventory-1st Version; BDI-II=Beck Depression Inventory-2nd Version; POMS=Profile of Mood States; HRSD=Hamilton Rating Scale for Depression; C-SOSI=Calgary Symptoms of Stress Inventory; CGI-S=Clinical Global Impression-Severity of Depression IDAS= Inventory for depression and anxiety symptoms; PROMIS= Patient-Reported Outcomes Measurement Information System; SCL-90=Symptom Checklist 90-Revised.

Studies exploring mindfulness and depressive symptoms in participants with depressive symptoms secondary to another health problem

Of the 25 studies included in table 8 above 11 did not involve measuring the impact of mindfulness training on people with clinical diagnoses. These instead examined the relationship between mindfulness and other constructs including depressive symptoms. Two of these focused on the role of mindfulness in eating behaviours finding that the facets Actaware and Nonjudge (Levin et al., 2014; Tak et al., 2015) and also the facet Describe (Tak et al., 2015) predicted problem eating behaviours. A further study identified that the facets Nonjudge and Actaware were significantly inversely related to depressive symptoms (Moskowitz et al., 2015) whilst another reported that all facets were significantly negatively related to depression, except for Observe (Desrosiers et al., 2013b), which was identified in a further study to be positively associated with symptoms of depression unless its impact were mitigated by high levels of the facet Nonreact (Desrosiers et al., 2014).

Study designs including mindfulness training as an element assessed the impact of taking participants through a programme designed to increase levels of mindfulness and exert a positive effect on a range of symptoms. Samples in these studies presented with a variety of diagnoses including health anxiety, PTSD, HIV, medically unexplained symptoms, borderline personality disorder, multiple sclerosis, diabetes, eating problems, cancer, tinnitus and people experiencing stress-related

problems, illness, anxiety, and chronic pain. Overall, studies employing mindfulness training were associated with increased levels of mindfulness as measured by the FFMQ post intervention in both uncontrolled and controlled studies with only one exception (Kearney et al., 2013b). However, not all studies report that facets are consistently increased with mindfulness training. For example, Van Rajestein and colleagues found that only the facets Observe and Describe were significantly raised at nine months follow up in a sample of people with medically unexplained symptoms (Van Rajestein et al., 2013), and another reported that all facets except for Actaware were raised post intervention (Gans et al., 2014). Where studies identified increased scores on the FFMQ following mindfulness training this tended to be significantly inversely related to depression (Garland et al., 2013; Gans et al., 2014; Heeren et al., 2015; Kearney et al., 2012; Kearney et al., 2013a; Lovas et al., 2010) though not all studies found this to be the case (Branstrom et al., 2010; McManus et al., 2012). The facet Nonjudge was identified as exerting the strongest effect on depressive symptoms in one study to measure the impact of individual facets (Garland et al., 2013). Overall, studies included in table 8 continue to highlight the negative relationship between mindfulness and symptoms of depression and indicate that increased levels of mindfulness mediate improvements in depressive symptomatology (Heeren et al., 2015; Carmody & Baer, 2008; Curtiss & Kiemanski, 2014; Levin et al., 2014).

In addition to measuring mindfulness and depressive symptoms in non-depressed samples and those with a range of health problems as highlighted in tables 7 and 8 above, 14 studies involved participants with a diagnosis of depression. These are summarised in the table below.

2.5.3 Mindfulness and depressive symptoms in participants experiencing current or historic major depressive disorder

Table 9 Studies exploring mindfulness and depressive symptoms in participants experiencing current or historic major depressive disorder

Authors	Title	Study sample	Study design	Key measures	Key findings
Battle, Uebelacker, Magee, Sutton & Miller (2015)	Potential for prenatal yoga to serve as an intervention to treat depression during pregnancy	Women 12-26 weeks pregnant experiencing an episode of depression during pregnancy (n=34)	Pilot intervention study using assessor rated and self-report measures to evaluate the impact of yoga training on maternal depression. Self-report measures completed pre/post intervention	FFMQ QIDS EPDS	Nonjudge and Actaware increased significantly following the intervention All facets correlated significantly and negatively with depression except for Observe Significant reductions in depressive symptoms were associated with time spent practicing yoga

Brennan, Barnhofer, Crane, Duggan, & Williams (2015)	Memory Specificity and Mindfulness Jointly Moderate the Effect of Reflective Pondering on Depressive Symptoms in Individuals With a History of Recurrent Depression	Participants had experienced three or more depressive episodes (n=274)	Study utilising self-report measures of depressive symptoms, rumination— including subscales for reflection and brooding— and mindfulness, as well as an autobiographical memory task to explore relationship between these factors using correlational analyses	FFMQ BDI-II RRS	Depression and the FFMQ were significantly negatively correlated FFMQ and Reflective pondering had no significant correlation FFMQ and Reflective brooding had a significantly negative correlation Reflection associated with increased depressive symptomatology in those with deficits in memory specificity and mindfulness (particularly Nonjudge). Reflection was
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					associated with fewer symptoms of depression in participants who did not show deficits in these capacities
Chiesa, Castagnera, Andrisanoa, Serrettia, Mandellia, Porcellia & Giommi (2015)	Mindfulness-based cognitive therapy vs. psycho-education for patients with major depression who did not achieve remission	Participants had current depression which had failed to remit with anti-depressant medication (n=43)	RCT comparing the impact of MBCT versus psychoeducation on depressive symptoms. Self-report measures completed at 4, 8,17 and 26-weeks	FFMQ HAM-D BDI-II	Both groups had significantly increased mindfulness on facets Nonreact, Nonjudge and Actaware MBCT group had significantly reduced depression compared to control group

following
antidepressant
treatment

Crane, Jandric, Barnhofer & Williams (2010)	Dispositional Mindfulness, Meditation, and Conditional Goal Setting	Study 1. Participants with a history of three or more depressive episodes and current depressive symptomatology (n=25)	Study 1. Questionnaire based intervention study using correlational analyses to explore changes in mindfulness and conditional goal (CGS) setting over a 3-4 month period in participants participating in a RCT of MBCT	Study one: FFMQ Study two: FFMQ BDI-II	Study one: Non-statistically significant change from pre-post intervention indicating that increases in mindfulness are associated with parallel changes in conditional goal setting Study two: Low mindfulness correlated with high conditional goal setting was also found in a non-clinical sample
		Study two.	Study 2. Questionnaire based intervention study		

		Healthy adults (n=55)	using correlational analyses to explore the impact of brief periods of either breathing or loving kindness meditation on CGS and mindfulness		
Dimidjian, Beck, Felder, Boggs, Gallop & Segal (2015)	Web-based mindfulness-based cognitive therapy for reducing residual depressive symptoms: An open trial and quasi-	Participants had previous depressive episode (n=200)	Questionnaire based intervention study evaluating the impact of a web-based mindfulness training on residual depressive symptoms compared to TAU	FFMQ PHQ9	Mindfulness training group experienced overall increase in mindfulness and reduction in residual depressive symptoms compared to control group that was sustained at six month follow-up

experimental
 comparison to
 propensity
 score matched
 controls

Eisendrath, Gillung, Delucchi, Mathalon, Yang, Satre, Rosser, Sipe & Wolkowitz (2015)	A Preliminary Study: Efficacy of Mindfulness- Based Cognitive Therapy versus Sertraline as First-line Treatments for	Participants with acute MDD (n=43)	A nonrandomized controlled trial examining MBCT to 8 weeks of monotherapy with the antidepressant sertraline. Self-report and assessor rated measures were completed pre/post intervention	FFMQ HAMD-17 QIDS-SR16	No significant difference in depressive symptoms between groups as measured by HAMD QIDS-SR16 outcomes favoured MBCT
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	Major Depressive Disorder				
Leong, Chan, Grabovac, Wilkins-Ho & Perri (2013)	Changes in mindfulness following repetitive transcranial magnetic stimulation for mood disorders	Patients with MDD (n=32)	Retrospective chart review of patients who had undergone an index course of rTMS for major depressive episode between 2009 and 2012. Assessor rated and self- report measures were used to examine the impact of transcranial magnetic stimulation on mood disorders	FFMQ HRSD PHQ9	Results showed statistically significant decreases in HRSD and PHQ-9 scores post intervention There was also significant increase in Nonreact

Muto & Mitamura (2015)	Acceptance and Commitment Therapy for "Taro," a Japanese Client with Chronic Depression: A Replicated Treatment-Evaluation	Participant with depressed mood (n=1)	Single case intervention study examining the effectiveness of acceptance and commitment therapy on depressive symptoms	FFMQ BDI-II	Post intervention improvements in depressive symptoms lapsed during follow-up
Paul, Stanton, Greeson, Smoski,	Psychological and neural mechanisms of trait	Male volunteers with depressive history	Participants completed a 2 day functional magnetic resonance imaging study. One day utilised a stress-	FFMQ BDI-II	Nonreact correlated negatively with rumination and negative bias following a stress induction task

Wang, (2013)	mindfulness in reducing depression vulnerability	(n=19)	induction task and the other day utilised a mindful breathing task in order to explore which FFMQ facets protect against negative bias and rumination using correlational analyses and fMRI results	Nonreact was inversely correlated with insula activation during inhibition to negative stimuli after the mindful breathing task Authors propose that results suggest non-reactivity to inner experience is the key facet of mindfulness that protects individuals from psychological risk of depression	
Preddy, McIndoo & Hopko (2013)	Abbreviated Mindfulness- Based Therapy for a Depressed	Undergraduate student with recurrent major depression and generalized	Questionnaire based single case study examining the impact of mindfulness training on depression and anxiety.	FFMQ BDI-II HRSD	Significant increase in mindfulness and reduction in depressive symptoms post intervention

	College Student	anxiety disorder (n=1)	Self-report and assessor rated measures completed pre/post intervention and at 1 month follow up		
Radford, Eames, Brennan, Lambert, Crane, Williams, Duggan & Barnhofer (2015)	Trait Mindfulness as a Limiting Factor for Residual Depressive Symptoms: An Explorative Study Using Quantile Regression	Participants with a history of three or more depressive episodes, currently in remission (n=274)	Questionnaire based study examining the effects of mindfulness on residual depressive symptoms, in relation to number of depressive episodes and severity of symptoms using quantile regression	FFMQ BDI-II	A negative relationship between the FFMQ and depression was found Results support the hypothesis that trait mindfulness acts as a limiting factor for the level of residual depressive symptoms experienced by individuals with a pattern of episodic depression when in remission

Sanders & Ham (2010)	Ruminative and mindful self-focused processing modes and their impact on problem solving in dysphoric individuals	Patients with a history of depression in remission and those without a history of depression (n=30)	Questionnaire based study using mood induction to explore the relationship between mindfulness and rumination via correlational analyses	FFMQ BDI-II RRS	Mindfulness correlated negatively with depression Rumination and depression positively correlated Induced mindfulness was linked to improvements in rumination and social problem solving
Walser, Karlin, Trockel, Mazina & Taylor	Training and implementation of acceptance and commitment therapy (ACT)	Therapists undergoing acceptance and commitment therapy (ACT)	Questionnaire based intervention study evaluating the impact of ACT training for therapists and patient outcomes	FFMQ BDI-II AAQ-II	Patients had increased mindfulness and reduced depressive symptoms post intervention

(2013)	commitment therapy in the veterans' health administration: Therapist and patient outcomes	training and their patients with depression (n=1,136)	using regression analyses. Self-report measures completed pre/post intervention and then at follow-up between 3-12 months later
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Walser, Garvert, Karlin, Trockel, Ryu & Taylor (2015)	Effectiveness of acceptance and commitment therapy in treating depression and suicidal	Veterans with depression and suicidal ideation (n=981)	Questionnaire based intervention study evaluating the impact of ACT on depressive symptoms and experiential avoidance	FFMQ BDI-II AAQ-II	Patients had increased mindfulness and reduced depressive symptoms including suicidal ideation post intervention
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ideation in
veterans

FFMQ=Five Facets Mindfulness Questionnaire; RRS=Rumination Responses Scale; AAQ-II=Acceptance and Action Questionnaire 2nd Version; PHQ9=Patient Health Questionnaire; BDI-II=Beck Depression Inventory-2nd Version; QIDS=Quick Inventory of Depressive Symptomatology; QIDS-SR16=Quick Inventory of Depressive Symptomatology-Self Report; EPDS=Edinburgh Postnatal Depression Scale; MASQ=the Mood and Anxiety Symptom Questionnaire; HRSD=Hamilton Rating Scale for Depression; HAMD=Hamilton Rating Scale for Depression; HAMD-17=Hamilton Rating Scale for Depression-17 item version.

Studies exploring mindfulness and depressive symptoms in participants experiencing current or historic major depressive disorder

The 14 studies in table 9 consist of single case studies, evaluations of mindfulness interventions and investigations exploring mediators, moderators and mechanisms of action in an attempt to explicate processes involved in bringing about changes in levels of mindfulness and depression. 10 studies involved measuring the impact of mindfulness training on depressive symptoms and other variables. All such trainings were associated with raised levels of mindfulness and a reduction in depressive symptomatology, with one finding that this was as effective as antidepressant medication (Eisendrath et al., 2015). Studies report particularly strong increases in the facets Nonjudge, Actaware (Battle et al., 2015) and Nonreact (Chiesa et al., 2015) associated with mindfulness training. Several studies reported a significantly negative correlation between all mindfulness facets and depression – except for the facet Observe which was unrelated to depressive symptomatology (Battle et al., 2015; Curtiss et al., 2014). A study by Curtiss and colleagues investigating mindfulness, generalised anxiety and depression (Curtiss et al., 2014) reported that the facet Actaware exerted a positive effect on depressive symptoms by reducing the impact of experiential avoidance. The facet Nonjudge was found in another study to offset the tendency of ruminative reflecting to be associated with increased symptoms of depression (Brennan et al., 2015), whilst Nonreact was further identified as a particularly helpful

facet in ameliorating the impact of rumination following a stress induction task (Paul et al., 2013). Findings from another study indicate that 'conditional goal setting', a factor implicated in depression, is incompatible with mindfulness (Crane et al., 2010).

In summary, studies included in table 9 illustrate that mindfulness training appears to increase levels of this in participants, and that an inverse relationship between mindfulness and depression continues to be found in those with current, or historical experiences of depression, with the exception of the facet Observe. Mindfulness facets are identified as mediating the relationship between experiential avoidance, rumination and depression.

Several methodological studies assess the psychometric robustness of the FFMQ or seek to clarify the role of facets in a range of samples. These are identified in the table below.

2.5.4 The psychometric properties of the FFMQ in non-clinical samples

Table 10. Studies investigating FFMQ mindfulness and its psychometric properties in non-clinical samples

Authors	Title	Study sample	Study design	Key measures	Key findings
Baer, Smith, Hopkins, Krietemeyer & Toney (2006)	Using Self-Report Assessment Methods to Explore Facets of Mindfulness	Studies 1 & 2. Undergraduate psychology students (n=613)	Study 1. Evaluation of psychometric characteristics of mindfulness questionnaires	FFMQ BSI SCS AAQ	Study 1. 5 pre-existing mindfulness questionnaires are modestly correlated with each other indicating that they measure similar but distinct constructs
		Studies 3, 4 & 5 New sample of Undergraduate psychology students	Study 2. Exploratory factor analysis (EFA)		Study 2. Combined questionnaires yield 5 factors. Correlated model best fit for data.
			Study 3. Confirmatory factor analysis (CFA)		Acceptable internal consistency reliability for all subscales ranging from 0.75-0.91
			Study 4. Correlational		

(n=268)

analyses

Study 3. 5 factor structure

confirmed in new sample

Study 5. Regression

analyses to test the
incremental validity of
mindfulness facets in
predicting psychological
symptoms

Study 4. Correlations in expected
directions supporting construct

validity except for the facet

Observe which, contrary to

predictions was positively

correlated with dissociation,

absent-mindedness, psychological

symptoms, and thought

suppression

Facets demonstrated significant

correlations with SCS & AAQ as

predicted

					Study 5. Actaware, Nonjudge and Nonreact significantly predicted psychological symptoms
Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Walsh, Duggan & Williams (2008)	Construct Validity of the Five Facet Mindfulness Questionnaire in Meditating and Nonmeditating Samples	Regular meditators (n=278) Demographically similar nonmeditators (n= 97) Nonmeditating community sample	Reliability and validity testing of the FFMQ utilising CFA and correlational analyses	FFMQ BSI	Marginally acceptable to good internal consistency reliability (0.67 to 0.92) Hierarchical factor structure confirmed in the meditating sample as predicted Higher mindfulness scores for meditators as predicted Facet Observe loads onto

		(n=313)			mindfulness factor in meditators but not non-meditators as predicted
		Nonmeditating student sample			
		(n=259)			Findings support the construct validity of the FFMQ and appear to confirm the hypothesis that observing is helpful when done mindfully, but incompatible with a mindful perspective when not
Baer, Samuel & Lykins (2011)	Differential Item Functioning on the Five Facet Mindfulness Questionnaire	Demographically Matched Meditators and Nonmeditators	Investigation of item response bias to FFMQ by analysing patterns of responding	FFMQ	Only minimal evidence for Differential Item Functioning found
	Is Minimal in	(n=230)			

	Demographicall y Matched Meditators and Nonmeditators				
Christopher, Neuser, Michael & Baitmangalk ar (2012)	Exploring the Psychometric Properties of the Five Facet Mindfulness Questionnaire	Mixed sample of meditators and non- meditators (n=349)	CFA conducted to assess factor structure of the FFMQ using individual items as indicators rather than item parcelling, as in initial validation studies	FFMQ CES-D	The internal consistency reliability for all facets was acceptable (0.84-0.93) Overall, results supported the five- facet hierarchical structure and provided a good fit for the data Actaware & Nonjudge had nonsignificant relationship with Observe in non-mediator sample

					Actaware, Nonjudge & Nonreact were predictive of depression
					Observe showed a positive relationship with depression
de Bruin, Topper, Muskens, Bögels & Kamphuis (2012)	Psychometric Properties of the Five Facets Mindfulness Questionnaire (FFMQ) in a Meditating and a Non-meditating Sample	Meditators (n=288) Nonmeditators (n=451)	Testing of the factor structure, internal consistency, construct validity, and predictive validity of the Dutch version of the Five Facet Mindfulness Questionnaire (FFMQ-NL)	FFMQ RRS	Five factor models fit for the data acceptably for both samples The internal consistency reliability for all facets was acceptable ranging from 0.70-0.89 Removal of facet Observe led to improved fit in the non-meditating sample, but not the meditating sample

Meditators scored more highly for mindfulness

Worry, rumination, and thought suppression were significantly (negatively) related to Nonjudging, Describing, Nonreacting, and Acting with awareness

Observing facet was not significantly related to any of the other constructs (except Alexithymia) in the nonmeditating sample

Nonjudge, Actaware & Nonreact

					significantly predicted psychological symptoms
Fernandez, Wood, Stein & Rossi (2010)	Measuring Mindfulness and Examining its Relationship With Alcohol Use and Negative Consequences	College-aged adults (n=316)	Examination of factor structure of FFMQ via CFA	FFMQ	CFA showed that whilst five factor model fit appeared adequate, facets Actaware and Nonjudge loaded negatively onto overarching/hierarchical mindfulness factor The internal consistency reliability for all facets was acceptable ranging from 0.70-0.90 Nonjudge was negatively related to alcohol-related consequences

					Describe was positively related to alcohol-related consequences
Goldberg, Wielgosz, Dahl, Schuyler, MacCoon, Rosenkranz, Lutz, Sebranek & Davidson (2015)	Does the Five Facet Mindfulness Questionnaire Measure What We Think It Does? Construct Validity Evidence From an Active Controlled Randomized Clinical Trial	Participants in RCT comparing MBSR and control groups (n=130)	Investigation of convergent and discriminant validity and sensitivity to change of the FFMQ	FFMQ SCL-90R	The internal consistency reliability for all facets was acceptable ranging from 0.79-0.92 Moderate-sized positive correlations between all FFMQ subscales with psychological well-being were found in support of convergent validity Nonjudge was shown to correlate significantly negatively with psychological symptoms

					Facets of the FFMQ were shown to increase over the course of an MBSR intervention relative to a waitlist control condition
					Discriminant validity not supported: both mindfulness training and health education led to increases in mindfulness scores
Lilja, Lundh, Josefsson & Falkenström (2013)	Observing as an Essential Facet of Mindfulness: A Comparison of FFMQ Patterns in Meditating	Meditators and non-meditators (n=817)	Cluster analysis of responding to FFMQ in two samples to investigate role and behaviour of facet Observe	FFMQ	The internal consistency reliability for all facets was acceptable ranging from 0.75-0.90 13 clusters based on scoring patterns identified. Meditator clusters all had high scores on

and Non-
Meditating
Individuals

Observe

One meditator cluster had high
Observe combined with low
Nonjudge, contrary to predictions

The results from the present study
support the assumption that when
individual patterns of responding
the FFMQ are analysed, the
apparently contradictory role of
Observe is absent

Neale- Lorello & Haaga (2015)	The "observing" facet of mindfulness moderates	Community sample including 112 meditators & 78	Hierarchical multiple regression analysis to examine ability of the facet Observe to buffer against	FFMQ BSI	There was a significant interaction between observing, stress & meditation, such that the effect of stress on distress was smallest
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	stress/symptom relations only among meditators	non-meditators (n=190)	stress and distress amongst meditators compared to non-meditators		among meditators scoring high on observing Authors propose that results suggest meditation helps people learn to observe internal and external experience in an unbiased manner lending itself to constructive coping
Tran, Gluck & Nader (2013)	Investigating the Five Facet Mindfulness Questionnaire (FFMQ): Construction of a Short Form	Community sample (n=640) Student	Psychometric testing utilising EFA & CFA to develop a short form of the FFMQ	FFMQ GSI	A shortened, 20 item, two factor form of the FFMQ developed and best model fit. Factors labelled: Self-regulated attention & Orientation to experience Facet Nonreact found to be a

	and Evidence of a Two-Factor Higher Order Structure of Mindfulness	(n=333)			weak indicator of its intended construct
Tran, Cebolla, Gluck, Soler, Garcia- Campay & von Moy (2014)	The Serenity of the Meditating Mind: A Cross- Cultural Psychometric Study on a Two-Factor Higher Order Structure of Mindfulness, Its Effects, and	Meditators (n=1,284)	Factor analyses of short form of the FFMQ	FFMQ BSI	Confirmation of a two-factor higher-order structure of mindfulness, delineating Self- regulated Attention and Orientation to Experience Authors propose that results suggest that self-reported mindfulness is, both among meditators and non-meditators, a multi-faceted, but two-factorial

	Mechanisms				construct, whose homogeneity
	Related to				increases with meditation
	Mental Health				experience
	among				
	Experienced				
	Meditator				
Van Dam, Earlywine & Danoff-Burg (2009)	Differential item function across meditators and non-meditators on the five Facet Mindfulness Questionnaire	University students and meditators (n=321)	Investigation into differential item function of positively and negatively worded items of the FFMQ depending on meditation experience	FFMQ	Meditators were more likely to endorse both positively and negatively worded items equally whilst non-meditators were more likely to endorse positively worded items Authors suggest that this undermines the construct validity of the FFMQ

Van Dam, Burg & Earleywine (2012)	Mind Your Words: Positive and Negative Items Create Method Effects on the Five Facet Mindfulness Questionnaire	University students (n=459)	Study employed CFA to examine the validity of a hierarchical mindfulness model and whether response patterns related to item wording arose from method effect	FFMQ	A correlated five-factor model fit the data better than a hierarchical five-factor model and model without Observe. Authors propose that this undermines FFMQ as comprising multiple dimension representing a single overarching construct Wording of items contributed to responses, possibly related to differences among groups
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FFMQ=Five Facets Mindfulness Questionnaire; SCS=Self-Compassion Scale; RRS=Rumination Responses Scale; AAQ=Acceptance and Action Questionnaire; CES-D=Centre for Epidemiological Studies Depression Scale; BSI=Brief Symptom Inventory; GSI=Global Severity Index; SCL-90=Symptom Checklist 90-Revised.

Studies investigating FFMQ mindfulness and its psychometric properties in non-clinical samples

The studies listed in table 10 all investigated the psychometric properties of the FFMQ, employing samples of students or meditators and non-meditators. Nearly all studies assessing internal consistency reliability reported this as acceptable across samples (Cronbach's alpha scores >0.70) and that overall, the FFMQ demonstrated predicted correlations with related variables, supporting construct validity of the measure. For example the facets Nonjudge, Nonreact and Actaware were found in two studies to predict psychological symptoms (Baer et al., 2006; de Bruin et al., 2012). Studies also identify that meditators tend to score more highly on the FFMQ than non-meditators, in line with expectations, supporting confidence in its construct validity (Baer et al., 2008; Van Dam et al., 2009; de Bruin et al., 2012).

Tran and colleagues identified a shortened two factor model consisting of elements of attention and acceptance following exploratory and confirmatory factor analysis (Tran et al., 2013; Tran et al., 2014). However, studies examining the factor structure of the FFMQ overall report that a five factor correlated model fits the data well in student samples and that a hierarchical model yields improved fit in those with meditation experience. These results appear influenced by the unexpected findings relating to the facet Observe. Regarded as a fundamental element of a mindfulness construct, initial researchers of

the FFMQ were surprised to find that Observe did not load onto an overarching mindfulness factor, and that correlations between this and other facets were inconsistent with predictions (Baer et al., 2006). Studies additionally reported the unexpected findings that Observe is positively linked to psychological symptoms such as absentmindedness, disassociation (Baer et al., 2006) and depression (Christopher et al., 2012). Several subsequent studies therefore focus on the behaviour of the facet Observe and seek to clarify its changing role in the experience of mindfulness, using samples containing meditators and non-meditators to explore this (Baer et al., 2008; Van Dam et al., 2009; Baer et al., 2011; Christopher et al., 2012; de Bruin et al., 2012; Lilja et al., 2013; Neale-Lorello & Haaga, 2015). In general these support early findings that the role of Observe varies depending on meditation experience, highlighting that its apparently contradictory role disappears when it is accompanied by meditation experience (Lilja et al., 2012), and that high levels of this may even protect individuals from the potentially detrimental impact of stress (Neale-Lorello & Haaga, 2015).

Whilst the majority of studies supported the psychometric properties of the FFMQ, some presented results contradicting this. For example, Van Dam and colleagues presented findings undermining construct validity of the FFMQ by highlighting the likelihood of those with and without meditation experience responding to items based on different understandings of their meaning (Differential Item Functioning, DIF: Van Dam et al., 2009; Van Dam et al., 2012). However, a further study

identified that where meditators and non-meditators were demographically matched, DIF is unlikely to unduly influence results (Baer et al., 2011).

In addition to the studies identified in table 10 above, several other studies report findings from adapting the FFMQ for different languages and cultures (Cebolla 2012; de Barros et al., 2015; Deng et al., 2011; Dundas et al., 2013; Giovannini et al., 2015; Heeren et al., 2011; Hou et al., 2014; Lilja et al., 2011; Sugiura et al., 2012; Veehof et al., 2011) and specific clinical problems (Adam et al., 2014; Truijens et al., 2015). Overall, these studies demonstrate acceptable internal reliability consistency, and acceptable factor structure similar to those found in the original version of the FFMQ.

In summary, the studies listed in table 10 appear to support the psychometric soundness of the FFMQ in non-clinical samples. Internal consistency reliability is reported as acceptable in all studies to measure this. Overall, correlations between facets of the FFMQ and related variables suggest this construct has validity. Despite some exceptions (Tran et al., 2013; Tran et al., 2014) the five factor model is supported by these investigations, though all factors only represent an overarching construct of mindfulness in those with meditation experience, as findings indicate that the facet Observe is otherwise associated with phenomena antithetical to conceptualisations of this.

In addition to evaluations of the psychometric properties of the FFMQ in non-clinical samples consisting predominantly of university students and meditators/non-meditators, four studies attempt to assess these in a range of clinical samples including fibromyalgia, a mixed sample with anxiety and depression, and those with active levels of depression or a history of depressive disorder. These are summarised in the following table.

2.5.5 The psychometric properties of the FFMQ in clinical samples

Table 11. Studies exploring the psychometric properties of the FFMQ in clinical samples

Authors	Title	Study sample	Study design	Key measures	Key findings
Bohlmeijer, ten Klooster, Fledderus, Veehof & Baer (2011)	Psychometric Properties of the Five Facet Mindfulness Questionnaire in Depressed Adults and Development of a Short Form	Participants with mild-to-moderate depression (n=376) Participants with Fibromyalgia (n=146)	Evaluation of the psychometric properties of the FFMQ in a depressed sample via reliability testing, factor analyses and tests of convergent/divergent validity. Participants were randomly assigned to	FFMQ CES-D AAQ-II	The internal consistency reliability for all facets was acceptable ranging from 0.73-0.91 Confirmatory factor analyses (CFA) showed acceptable model fit in both the correlated and hierarchical factor models, with slightly better fit for correlated Nonjudge was unrelated to the facets Observe and Describe As predicted Nonjudge and Actaware

the three following conditions: the ACT and mindfulness-based intervention with minimal e-mail support (n=125), the same intervention with extensive e-mail support (n=125), or a waiting list (n=126).

were most strongly negatively correlated with depression and anxiety

Nonjudge and AAQ-II showed the strongest correlation

The internal consistency reliability for all facets of the short form was acceptable ranging from 0.73-0.87

CFA showed good model fit for the structure of the FFMQ-SF. The replicability of the five-factor structure of the FFMQ-SF was confirmed in the fibromyalgia sample

Both instruments proved highly sensitive

to change.

Authors conclude that both the FFMQ and the FFMQ-SF are reliable and valid instruments for use in adults with clinically relevant symptoms of depression and anxiety

Curtiss &
Klemanski
(2014)

Factor
Analysis of
the Five Facet
Mindfulness
Questionnaire
in a
Heterogeneous
Clinical

Treatment
seeking
adults with
anxiety and
depressive
symptoms
(n=153)

Assessment of the
psychometric
properties of the
FFMQ with mixed
sample with anxiety
and depressive
symptoms

FFMQ
MASQ
AAQ-II

Internal consistency reliability within
acceptable range (0.80-0.92)

Four factor correlated and hierarchical
models fit the data well

Observe showed no relationship with two
other mindfulness facets (Nonjudge &

	Sample		Facet Observe removed from factor analysis due to prior studies indicating its poor fit with non- meditating samples		Actaware) Results favour a four factor hierarchical model for a sample of individuals with heterogeneous psychopathology
Veehof, ten Klooster, Taal, Westerhof & Bohlmeijer (2011)	Psychometric properties of the Dutch Five Facet Mindfulness Questionnaire (FFMQ) in patients with fibromyalgia	Participants with self- reported fibromyalgia (n=141)	Examination of factor structure, reliability and validity of the FFMQ in participants with fibromyalgia	FFMQ HADS AAQ-II	The internal consistency reliability was marginally acceptable ranging from 0.69- 0.90 Test-retest reliability was good to excellent CFA confirmed the correlated five-factor structure of the FFMQ a better fit than hierarchical model

					Observe correlated significantly negatively with Nonjudge
					Construct validity was supported by the moderate to large correlations with related constructs (except observe facet)
					Actaware and Nonjudge had incremental validity over the others in predicting mental health and psychological symptoms, including depression
Williams, Dagleish, Karl & Kuyken	Examining the factor structures of the Five Facet	A convenience sample of adults	Investigation of the factor structure of the FFMQ via CFA	FFMQ	Internal consistency reliability within acceptable range (0.77-0.93) CFA showed that a four-factor

(2014)

Mindfulness (n=940)

Questionnaire

and the Self A sample of

Compassion adults who

Scale practice

Meditation

(n=235)

A sample of

adults who

suffer from

recurrent

depression

(n=424)

hierarchical model of the FFMQ best fits

the community sample and the clinical

sample

A five-factor hierarchical model of the

FFMQ best fits the meditator sample

FFMQ=Five Facets Mindfulness Questionnaire; CES-D=Centre for Epidemiological Studies Depression Scale; HADS=Hospital Anxiety and Depression Scale; BSI-18=Brief Symptom Inventory-18 Items; MASQ=the Mood and Anxiety Symptom Questionnaire.

Studies exploring the psychometric properties of the FFMQ in clinical samples

The studies listed in table 11 above involved psychometric testing of the FFMQ in a range of clinical samples including those with active levels of mild-moderate depression, recurrent depression in remission, mixed anxiety and depression and participants with fibromyalgia. All studies reported acceptable internal consistency reliability with Cronbach's alpha scores ranging from 0.69-0.93. Test-retest reliability was supported by the only study to evaluate this with a paired samples *t* test showing no significant difference between scores at baseline and 2 weeks later (Veehof et al., 2011). Overall, facets of the FFMQ demonstrated predicted correlations with related constructs, increasing confidence in the validity of this questionnaire with clinical samples. For example, the facet Nonjudge consistently showed the strongest correlation with experiential avoidance as expected (Bohlmeijer et al., 2011; Curtiss & Klemanski, 2014; Veehof et al., 2011), and the facets Nonjudge and Actaware echo other study findings by demonstrating the closest relationship with psychological symptoms, including depression (Bohlmeijer et al., 2011) and incremental validity in the prediction of this (Veehof et al., 2011). The facet Observe continues to demonstrate a distinctive pattern of relationships with other aspects of the FFMQ and related variables, with findings indicating that it is unrelated to depression, whilst other facets demonstrate a negative relationship with this (Curtiss & Klemanski, 2014; Bohlmeijer et al., 2011; Veehof et al.,

2011). It is also found to be either unrelated or have a negative relationship with the facet Nonjudge (Curtiss & Klemanski, 2014; Veehof et al., 2011) and to have no relationship with the facet Actaware (Curtiss & Klemanski, 2014).

Factor analyses overall reveal that both correlated and hierarchical models of mindfulness fit the data acceptably (CFI >0.90), with a correlated model marginally favoured in samples with mild-moderate depression (Bohlmeijer et al., 2011), recurrent depression (Williams et al., 2014) and in patients with fibromyalgia (Veehof et al., 2011). In line with previous studies investigating factor structure of the FFMQ, two of the studies in table 11 report that removal of the facet Observe leads to improved model fit in clinical and non-meditating samples (Williams et al., 2014; Curtiss & Klemanski, 2014).

In summary, findings from studies examining the psychometric properties of the FFMQ in clinical samples indicate that it possesses acceptable internal consistency and test-retest reliability. Construct validity is supported by its relationship with related constructs, including depression. The facet Observe continues to show a contradictory relationship with other facets of the FFMQ and related variables, and this pattern of findings is reflected in the factor structure which suggests that whilst a five factor model fits the data reasonably well, model fit may be improved by removing the facet Observe from this construct in those with clinical problems and without meditation experience.

2.6 Discussion of literature review findings

Reviewing current uses of the FFMQ alongside measurement of depressive symptoms highlights several key issues about the relationship of these constructs. For example, the majority of intervention studies involving mindfulness training report that mindfulness training resulted in raised levels of mindfulness and reduced depressive symptomatology, with only three exceptions (McManus et al., 2012; Josefsson et al., 2014; Branstrom et al., 2010). However, none of these studies specifically targeted depressive disorders and involved either shortened mindfulness interventions (Josefsson et al., 2014) or used instructors with only minimal experience of leading MBSR programmes (Branstrom et al., 2010). Moreover, MBSR is designed for generic stress and wellbeing, rather than founded on a theoretical understanding of maintenance processes in depressive disorder and consequently may not be expected to influence symptoms of this as effectively as MBCT. It is notable that intervention studies utilising only samples with active or historic depression consistently resulted in increased mindfulness post intervention with a corresponding reduction in depressive symptomatology. Studies overall therefore indicate that mindfulness and depression are characterised by an inverse relationship – high levels of mindfulness are invariably accompanied by low levels of depressive symptoms across samples measured in nearly all studies, and all studies including participants with depressive disorder. It consequently appears that simultaneously high levels of these constructs are incompatible,

strengthening arguments for the use of mindfulness-based approaches in treating depressive disorders.

FFMQ Facets most consistently related to depression include Nonjudge, Actaware and Nonreact. Of these three facets Nonjudge and Actaware were most commonly found to demonstrate the strongest negative relationship with depression and were noted to be predictive of psychological symptoms, including depression (e.g., Moskowitz et al., 2015). Of these facets, three studies report that Nonjudge exerts the strongest effect on depressive symptoms (Gilbert et al., 2012; Petrocchi & Ottaviani, 2015; Garland et al., 2013). This facet contains items similar to the self-compassion scale (Neff, 2003a) which has been identified as mediating improvements in depression in a previous study investigating mechanisms of action in MBCT for depression (Kuyken et al., 2010). Studies in this review and the wider literature therefore suggest that developing an increased capacity for non-judgement and self-compassion will assist improvement in depressive symptoms. Studies also highlight that the facet Describe tends to correlate negatively with depression whilst Observe demonstrates an apparently contradictory relationship with this, being either unrelated or positively related to depressive symptoms, despite being regarded as a fundamental element of mindfulness. Where high levels of Observe exist, the likelihood of depressive symptoms increases substantially. However, its detrimental impact is potentially mitigated by the presence of other mindfulness facets, particularly Nonreact, Nonjudge and Actaware. Indeed, a latent

profile analysis categorising individual responses to the FFMQ and a depression measure in psychology students (n=663) found that participants scoring high on Observe were likely to have heightened levels of depressive symptomatology unless accompanied by high levels of Nonjudge and Actaware (Pearson et al., 2015b), whilst another study also involving psychology students (n=102) reported that a heightened capacity for Nonreactivity offset the tendency of high levels of Observe to result in increased depression (Barnes & Lynn, 2010).

Several studies have noted the relationship between mindfulness and related constructs including rumination, experiential avoidance, self-compassion, perfectionism, neuroticism, conditional goal setting and suicidal ideation. Correlational analyses report predicted relationships with these variables and potentially further understanding of the nature and role of mindfulness in depressive disorders. For example, findings highlight the role of mindfulness in reducing the impact of neuroticism on depressive symptoms (Barnhofer et al., 2011) and how mindfulness may positively influence the negative impact of perfectionism (Short et al., 2015). The interaction between mindfulness and rumination and the subsequent impact on symptoms of depression were also explored in other studies supporting its role in offsetting unhelpful thinking patterns (Desrosiers et al., 2013a), particularly brooding (Brennan et al., 2015) and supports its use in depressive disorders where repetitive rumination is regarded as a key aggravating factor (Segal et al., 2013). Overall, findings from these studies appear to support the construct validity of the

FFMQ through demonstrating its incompatible relationship with depression and other constructs antithetical to psychological wellbeing. Methodological studies included in tables 10 and 11 directly assess the validity and reliability of this measure of mindfulness.

Methodological studies reviewed highlight that internal consistency reliability was adequate across all samples, as signified by Cronbach alpha scores in excess of 0.70 with two exceptions (Baer et al., 2008; Veehof et al., 2011). The author was able to identify only two studies conducting test-retest reliability (Petrocchi & Ottaviani, 2015; Veehof et al., 2011). These utilised samples of university staff and students (Petrocchi & Ottaviani, 2015) and participants with fibromyalgia (Veehof et al., 2011), both of which scored within the normal range for depressive symptoms. Times between FFMQ completion were 2 weeks (Veehof et al., 2011) and 20 months (Petrocchi & Ottaviani, 2015). Test-retest reliability in both studies was evaluated via correlational analyses to assess potential fluctuations over time. FFMQ facets demonstrated high correlations with each other at time one and time two in those with fibromyalgia (Veehof et al., 2011) and for all facets except Observe in university staff and students (Petrocchi & Ottaviani, 2015), supporting the test-retest reliability of the FFMQ. However, both studies had substantially reduced numbers of participants at time two, with only 44 (Petrocchi & Ottaviani, 2015) and 38 participants (Veehof et al., 2011), considerably lower than the recommended minimum of 100 (Kline, 2000). Nevertheless, studies testing the psychometric soundness of the

FFMQ to date suggest that it possesses acceptable internal consistency and test-retest reliability.

Findings from CFA overall confirm the factor structure of the FFMQ, with some exceptions (Tran et al., 2013; Tran et al., 2014), indicating that both a correlated and hierarchical model fit the data acceptably well in all samples tested. In participants with meditation experience a hierarchical model is the best fit, whereas studies utilising samples without this slightly favour a correlated model. These findings result from the function of the facet Observe which, contrary to initial expectations (Baer et al., 2006) appears to alter with meditation experience, leading to some researchers calling for the FFMQ to be used without this facet unless participants have a history of meditation practice (Williams et al., 2014). Correlational analyses echo this pattern with facets demonstrating predicted associations with related constructs except for the facet Observe, unless participants have meditation experience. These findings are reflected by the only studies including samples with depressive disorder (Williams et al., 2014; Bohlmeijer et al., 2011). The most recent of these (Williams et al., 2014) involved participants in remission from recurrent depressive disorder (n=424), a large convenience sample of adult non-meditators (n=940) and participants with a current mindfulness practice (n=235). In addition to establishing acceptable internal consistency reliability, this study investigated its factor structure in a sample yet to be evaluated in this way. As highlighted above, findings from this study confirmed previous factor analyses: a four factor solution

with Observe removed is the best fit for those without a meditation practice. The second study utilised a sample with clinical levels of depressive symptomatology (Bohlmeijer et al., 2011). This carried out reliability and validity testing with a sample of adults recruited from the community (n=376) who were experiencing mild to moderate levels of depression as initially identified using a self-report measure (Center of epidemiological studies – depression scale: CES-D: Radloff, 1977). Adequate internal consistency of the FFMQ with this population was demonstrated, with alpha coefficients ranging from 0.71-0.91 across all facets. Construct validity was supported by significant negative correlations between the FFMQ, experiential avoidance and neuroticism. Both a correlated and hierarchical factor structure were acceptable with a four factor correlated model preferred. However, the sample involved in this study were defined through use of a self-report measure and telephone interview using the depressive episode module of the Mini International Neuropsychiatric Interview (MINI: Sheehan et al., 1998). The study sample is therefore not a well-defined sample with major depressive disorder, but includes a mix of those with clinical symptoms as well as mild to moderate depressive disorder.

2.6.1 Concluding comments

The need for psychometrically sound measures of mindfulness has been observed in literature relating to mindfulness in order to more fully understand the construct (Dimidjian & Linehan, 2003a; Sauer & Baer, 2010). Moreover, the absence of a measure of mindfulness that reliably

and accurately captures this construct potentially obstructs understanding of its role in depression and increases the risk of research into this area producing spurious results. This literature review sought to clarify uses of the FFMQ since its creation in 2006, in order to establish its psychometric properties in depressive disorder. It identified 261 published studies using the FFMQ of which 17 included samples with depressive disorder. 28 methodological studies involved psychometric testing of the FFMQ in samples predominantly comprising students and participants identified as meditators. To date, only two published studies involve investigation of the psychometric properties of the FFMQ in samples diagnosed with depressive disorder (Williams et al., 2014; Bohlmeijer et al., 2011). Overall, study findings support confidence in the FFMQ as a psychometrically sound measure of mindfulness. However, existing studies involving participants with depressive disorder have excluded those with more severe and chronic types of this. Its psychometric properties with these populations have therefore yet to be established.

2.7 Rationale for the present study

As discussed, depression is a huge and growing problem, not least because of its tendency to reoccur. The most rigorously tested psychological therapy, CBT, is hypothesised to work because it teaches people to become aware of and stand back from unhelpful thinking patterns (metacognitive awareness). This phenomenon appears similar to Buddhist mindfulness which has consequently been combined with

cognitive therapy as a treatment for depression, known as MBCT. Increased levels of mindfulness have therefore become an aim of treatment but there exists no measure of mindfulness with demonstrated psychometric robustness in participants with moderately severe and persistent depression, hampering efforts to further explore and clarify its role in this problem. Furthermore, there is currently a lack of investigation of individual's experience of mindfulness at a qualitative level that explores the relationship between mindful awareness and depression. A study examining the role of mindfulness in depression using both quantitative and qualitative methods was therefore conducted to contribute to a more comprehensive understanding of the interrelationship between these factors and potentially assist the development of treatments targeting processes implicated in the onset and maintenance of this potentially life threatening disorder.

2.8 Study aims

The aim of the study was to investigate the role of mindfulness in the experience of moderate to severe, persistent depression. The following were the objectives, research questions and hypotheses investigated.

2.8.1 Objective 1

To determine the psychometric properties of the Five Facets Mindfulness Questionnaire (FFMQ) in a sample of participants with moderate to severe, persistent depression.

2.8.1.1 Research questions

Is the FFMQ a reliable and valid measure of mindfulness in people with moderate to severe, persistent depression?

Primary hypotheses:

FFMQ reliability

- The FFMQ will demonstrate acceptable internal consistency and test retest reliability (at six months) by exceeding a Cronbach's alpha and a Pearson's correlation coefficient minimum accepted value of 0.7 (Kline, 2000).

FFMQ factor structure

- The five factor correlational and hierarchical model will fit the data acceptably well according to fit indices
- The facets Describe, Nonjudge, Nonreact and Actaware will load significantly onto an overarching construct of mindfulness but that the facet Observe will not.

Correlations between FFMQ and related constructs

- Pearson correlation coefficients will be calculated and correlations between 0.5 and 1.00 considered strong, between 0.30 and 0.50 considered moderate, and <0.3 considered small or weak (Cohen, 1988). Hypotheses of correlational patterns are identified below.

Mindfulness and Depression

- All facets of the FFMQ are expected to significantly correlate negatively with depression, except for the facet Observe
- The strongest correlation with depression will be with the facet Nonjudge.
- It is hypothesised that there will be a statistically significant difference between non-depressed and depressed samples scores on the FFMQ: namely, that a non-depressed sample will score more highly on the FFMQ, indicating higher levels of mindfulness.

Secondary hypotheses:

Mindfulness and Experiential Avoidance

- It is hypothesised that all facets of the FFMQ will be significantly negatively correlated with the AAQ in both samples, except for Observe whose relationship will be non-significant. It is further predicted that the highest correlation coefficient will be between the facet Nonjudge and the AAQ, which will demonstrate a strong relationship.

Mindfulness and Rumination

- It is hypothesised that all facets of the FFMQ will be negatively correlated with the RRS, except for the facet Observe whose relationship is expected to be non-significant. Specifically, the subscale Brooding will demonstrate a nonsignificant correlation with the facet Observe and a negative, significant relationship with other facets. The subscale

Reflection will demonstrate significant but nevertheless weaker correlations with all facets except Observe.

- The strongest correlation is predicted to be between the facet Nonjudge and the RRS, which will be of moderate strength.

Mindfulness and Self-Compassion

- It is predicted that all facets of the FFMQ will be significantly positively correlated with the SCS. It is also predicted that the strongest correlation will be with the facet Nonreact.

2.8.2 Objective 2

To explore participants' experience of mindfulness during depressive episodes.

2.8.2.1 Research question

How do participants with moderate-severe depression experience mindfulness?

Chapter 3

Methods

3.1 Introduction

This chapter provides information about the quantitative and qualitative methods conducted as part of this study. It begins with an overview of research methods, the ontological and epistemological foundations of the study and information about the context in which it occurred. The mixed methods research design utilised to address the research questions and objectives listed in the previous chapter is identified, including information about the samples involved, inclusion criteria, recruitment and consent procedures, measures used, data collection and analyses employed.

3.2 Research methods

3.2.1 Background

Researchers employ chosen methods to collect and analyse data in order to answer their research questions (Polit & Beck, 2004). These research methods have evolved since their conception and until recently have fallen into two broad categories: quantitative and qualitative methods.

Quantitative methods traditionally operate within a positivist paradigm. Based on the ontological position of an objective measurable reality, research within this field employs techniques consistent with this view of meaningful knowledge acquisition. This includes the use of deductive reasoning to test hypotheses within a laboratory environment, and aiming to control for specific variables. Objective measurement and quantitative analysis seek to identify causal relationships between factors of interest, using large samples enabling findings to be generalised to a wider population. The stance of the researcher aims to be that of a neutral observer and strenuous efforts are made to minimise the risk of the researcher directly influencing or biasing findings (Firestone, 1987).

Traditionally, health care has primarily focused on the use of quantitative methods (Doyle et al., 2009). Whilst these form an essential part of current approaches to evidence based healthcare, these are not designed to capture patients' lived experience in all its variety and uniqueness. This instead requires appropriate qualitative approaches (Biggerstaff & Thompson, 2008). From the mid-1970s there has been a substantial increase in qualitative methods, traditionally associated with a constructivist paradigm, being used to address particular research questions as researchers became more interested in the context of individual human experience (Schwandt, 2000). Occupying an ontological position that argues against the notion of an independent reality, qualitative researchers instead assert that multiple constructed realities exist simultaneously, meaning that the identification of an

independent reality is neither achievable nor desirable (Johnson & Onwuegbuzie, 2004). The task of research from this perspective is therefore not to identify generalisable patterns of cause and effect, but to more deeply understand subjective experience. Frequently employed as an inductive approach, qualitative research tends to be used to develop, rather than to test theories. The researcher is regarded as an integral part of the research, with findings emerging directly from the interaction between the researcher and participants. The researcher is therefore immersed in the research process, rather than regarded as a separate, neutral entity.

Advantages and limitations of each approach are hotly debated within the field by protagonists on both sides of the argument. For example, quantitative methods assume that it is possible to isolate features of human experience from the context in which they occur, but in doing so potentially provide a distorted and one dimensional view of the reality it seeks to illuminate. On the other hand, qualitative enquiry typically focuses on exploring a small number of individuals' subjective experience, making generalisation of subsequent findings problematic. This debate has been labelled the 'paradigm wars' (Johnson & Onwuegbuzie, 2004), reflecting the intensity and strength of feeling with which this is conducted. The paradigm wars are predicated on the assumption that these two approaches are mutually exclusive and cannot be combined in any way that leads to meaningful results (Sandelowski, 2001). However, some researchers emphasise the value

and commonalities between these methods, arguing that combining these approaches may resolve weaknesses inherent within each of these (Creswell & Plano Clark, 2011; Johnson & Onwuegbuzie, 2004).

3.2.2 Mixed methods research

The categorical approach inherent within the paradigm wars has been increasingly challenged as the use of mixed methods research has become gradually more commonplace. This has arisen following a systematic approach to the development and use of mixed methods research beginning in the late 1980s (Creswell & Plano-Clark, 2011). Consequently, despite some continuing debate, mixed methods research has become increasingly recognised as an approach capable of uniting quantitative and qualitative approaches through the creation of a third paradigm (Johnson et al., 2007), and is now thought by some to be a dominant paradigm in healthcare research (O’Cathain et al., 2007).

As the use of mixed methods has progressed researchers have sought to clarify and more clearly define the approach, and the need to differentiate the approach from previous paradigms has been asserted (Greene et al., 1989). Mixed methods research is generally defined as comprising research that includes at least one qualitative and one quantitative method (Greene et al., 1989; Johnson & Onwuegbuzie, 2004; Doyle et al., 2009; Small, 2011). However, whilst some views support this description of mixed methods research it is also noted that inconsistency of definitions exist (Tashakkori & Teddlie, 2010). Initial

descriptions of mixed methods research tend to label this as studies simply utilising both quantitative and qualitative techniques within one study, as described above. Latterly however, the integration and synthesis of data from both approaches in order to generate a more complete understanding of a phenomena has been described (Doyle et al., 2009). The approach may yield a deeper understanding of a topic through adding words/pictures to numbers and vice-versa, providing a greater ability to capture the complexity of human experience (Doyle et al., 2009). This understanding of mixed methods research argues that the approach goes beyond simply ameliorating the weaknesses of each individual research method but rather leads to the generation of a new and deeper understanding through the purposeful integration of both approaches. It is therefore the integration of these that leads to the creation of new knowledge, unobtainable through traditional methods alone (Creswell & Plano-Clark, 2011).

An advantage of mixed methods research is its ability to address a wide range of research questions as the researcher is not limited to only a single method of enquiry. It is important that choice of design be informed by the question that the research is attempting to address (Doyle et al., 2009; Creswell & Plano-Clark, 2011), as each method can tackle different questions most effectively (Bryman, 2006). Other factors to consider include whether the research will be concurrent or sequential, the weighting of quantitative versus qualitative components and the level of interaction between these. The timing of mixing methods and relative

priority of each strand within the study is also to be considered (Creswell & Plano-Clark, 2011; Johnson & Onwuegbuzie, 2004).

A typology of mixed method designs classified by Creswell & Plano-Clark (2011) is summarised in the table below:

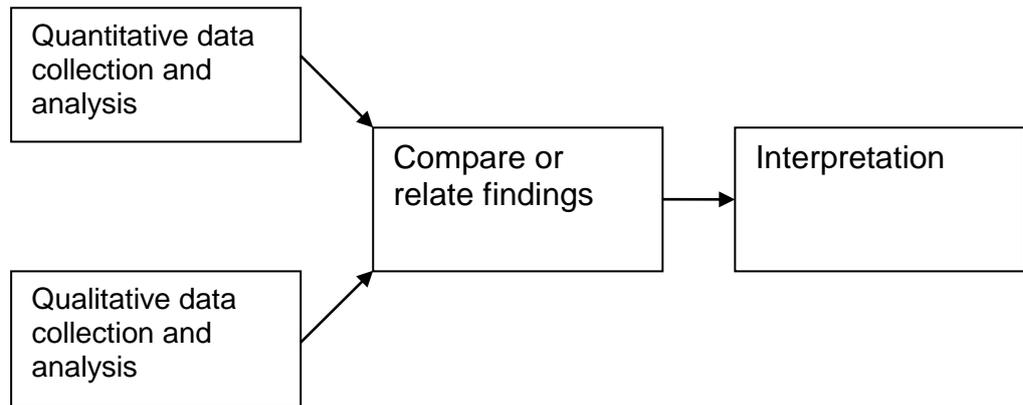
Table 12. Mixed Methods Designs

Design	Key features
Convergent parallel	Simultaneous independent data collection and analysis. Results merged to provide a more complete understanding of a phenomenon
Explanatory sequential	Strands occur in turn, with initial quantitative results being explained in more detail through qualitative enquiry
Exploratory sequential	Methods carried out sequentially, with the qualitative phase first. Quantitative method then seeks to test and further quantify initial qualitative findings
Embedded	An additional strand of research is added to a larger study to gather supplemental information about this

The most common use of mixed methods research reported in the literature is triangulation (Bryman, 2006). This term has covered many meanings since its inception to the extent that it has become regarded by some as a meaningless label (Bryman, 2006). In simultaneous triangulation data from both methods are collected during the same time point and findings only integrated during the analysis phase. This design is labelled by Creswell and Plano-Clark (2011) as convergent parallel (see figure 2). The simultaneous use of two methods in this way may be used to obtain different but complementary data on the same topic

(Morse, 1991). If findings converge this may increase confidence in these and has been labelled 'multi method confirmation' (Small, 2011).

Figure 2. Convergent Parallel Design



Despite a significant number of quantitative studies illustrating the benefits of MBCT for depression, a recent synthesis of qualitative studies of MBCT found only 14 papers focusing on mindfulness interventions and depression (Malpass et al., 2012), and in an initial search of approximately 2000 papers relating to mindfulness, the author found only one study using mixed methods research in this area (Finucane & Mercer, 2006). Therefore, it seems clear that despite the apparent advantages of mixed methods research and its growing popularity, it is less commonly employed than quantitative or qualitative approaches in mindfulness and depression research, perhaps because single methods may be a more appropriate design to answer questions of efficacy and clinical utility. The lack of mixed methods in this area may also be accounted for by a number of potential problems arising from this approach that have been observed from early uses onwards. For

instance, there may be difficulties in merging data sets represented alternatively in numbers and words, or problems responding to data sets that are sharply contrasting in their findings (Mitchell, 1986). It may be additionally problematic to attempt to merge data sets based on sample sizes that are very different. Comparing results from large, generalisable samples with small samples providing in-depth detail requires consideration if results are to retain credibility. Finally, it may be problematic to attempt to merge concepts integral to these approaches, as outlined within the paradigm wars (Mitchell, 1986). It is asserted by some that any combination of methods is riven with contradiction as each method is located within incompatible epistemologies, each holding different views about the nature of the reality it is attempting to understand. Therefore, considerable arguments about the commensurability of paradigms continues, with some in the literature stating that boundaries between these are immutable (Tashakkori & Teddlie, 2010), and that efforts to combine these within research are meaningless. It is argued that attention to philosophical underpinnings of a research study should be of even greater importance in mixed methods studies than single method studies due to the particular issues arising from combining approaches in this way (Lipscomb, 2008). Failure to do so potentially undermines the validity of arguments based on findings arising from such research (Lipscomb, 2008). Both Pragmatism (Morgan, 2008) and Critical Realism (Bhaskar, 1997) are put forward as philosophical systems that may in part resolve these difficulties.

3.3 Ontology and epistemology underpinning the methods used in this study

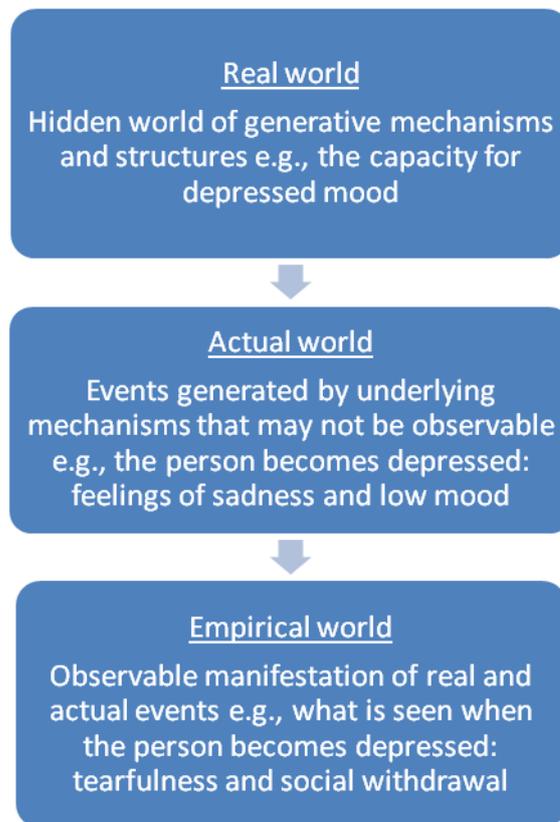
Pragmatism has arisen from the work of four philosophers working from the late 19th century onwards: Charles Pierce, William James, John Dewey and Richard Rorty. Pragmatism contends that the justification of a belief depends primarily on the success with which this can be applied to 'real world' situations (Feilzer, 2009). For example, theories are regarded as true to the extent that they appear to successfully explain observations about a phenomena (Morgan, 2008). If a theory were unable to successfully account for, or predict what is observed then it is unlikely that it would be accepted as 'true' or accurate knowledge. The means to achieve knowledge are therefore less important than the ability to apply it successfully, and methods employed in a study can consequently span those traditionally located only within a positivist or constructivist paradigm (Robson, 1993). This has led to pragmatism being cited as the philosophical underpinnings for many mixed methods studies.

Critical realism emerged as a philosophical theory in the 1980s and since its inception has been increasingly utilised as a philosophical framework for research in social sciences. In particular it is regarded as a system in which mixed methods research may be undertaken in a philosophically and theoretically coherent manner (Braun & Clarke, 2006). This perspective therefore potentially offers an alternative to the 'paradigm wars' through introduction of a philosophical framework asserting the

validity of both positivist and constructivist ideals within research. As well as recognising the strengths of both positivism and constructivism the development of critical realism was influenced by perceptions of inherent weaknesses within these: the tendency of positivism to ignore the interdependency between humans (e.g. researchers) and objects (e.g. participants) and the propensity of constructivism to over-emphasise these factors (Bhaskar, 1989). A range of research approaches may consequently be necessary if we are to understand the topic of investigation in greater depth. For example, a comprehensive understanding of society can't be gleaned either from behavioural manifestations and observations of this (quantitative approach), or from only enquiring about actor's constructions and meanings of this (qualitative approach: Aull Davies, 1999).

Within critical realism reality is conceptualised as comprising three interrelated layers (McEvoy & Richards, 2006) as highlighted in figure 3 below.

Figure 3. Critical Realism: three layers of reality



Critical realism is therefore founded on the notion that reality is layered and that knowledge is sought by digging through these layers. The surface appearance of things is potentially misleading, expressing only possibilities and tendencies arising from the interplay between different layers of reality and variables within these. Phenomena emerge from an interaction between these three strata resulting in observation of these within the empirical layer. It is sometimes referred to as 'depth realism' due to its emphasis on investigating beyond the empirical layer to the actual and real layers in order to understand more fully mechanisms and processes generating observable phenomena. The

mechanisms/structures that generate these phenomena are typically the objects of scientific study (Lipscomb, 2008).

Critical realism proposes that our understanding of experience, including our attempts to illuminate this through scientific study, exists within a social and historical context, and cannot be meaningfully abstracted from this, as empiricism contends. Nevertheless, the independent existence of a fundamental reality within this context is regarded as a key component influencing all aspects of experience as highlighted in figure 3 above. Our theories and ideas about this dimension do not constitute knowledge of reality, but can only ever be a description of reality, due to its inevitable saturation in human values and theories, informing its content via its social and historical context (Lipscomb, 2008). There is therefore no immediate or direct access to reality, making a finite understanding of this is an impossibility (Collier, 1994). Nevertheless, hypotheses about this can be made based on identification of patterns and observable tendencies, though with the recognition that such assertions are always provisional (Benton & Craib, 2001).

Bhaskar (1989) therefore distinguishes between what is known (called the transitive dimension) and what exists (labelled the intransitive dimension). These dimensions are separate; the reality of the world should not be conflated with our experience of it, but both elements are themselves real. This view therefore represents a realist ontology with a constructivist epistemology, recognising the existence and validity of

both. Enquiry into a phenomenon in order to investigate and clarify its properties and mechanisms can therefore legitimately consist of both quantitative and qualitative methods. Consequently, investigating the role of mindfulness in depression may be comprehensively and coherently undertaken using research methods able to explicate more fully the role of individual and social constructions (qualitative methods), as well as capture statistical patterns relating to these phenomena (quantitative methods).

Whilst the philosophical positions of both pragmatism and critical realism allow for mixed methods research to be conducted in a philosophically coherent framework, the latter is arguably the most suitable for a study of the sort described in this thesis. As stated above critical realism contends that reality consists of multiple layers; an objective reality exists but is filtered through our individual perceptions and social constructions about this and research aims to generate new insights into this. The aim of mindfulness within Buddhist philosophy is to work through layers of 'delusion' and confusion until clear seeing and understanding of an objective reality is achieved (nirvana). Both these approaches therefore involve working through constructed 'layers' in order to illuminate reality. Consequently, whilst there are differences between these approaches, parallels between a critical realist approach, mindfulness and theories underpinning these approaches make this a suitable philosophical framework within which to attempt to generate further knowledge about the relationship between mindfulness and depression using a mixed

methods research study design. The background and context in which this took place is described in the next section of this chapter.

3.4 Context of the study

This study was embedded within a large scale, multi-centre randomised controlled trial (RCT) which was part of a government initiative aiming to improve integration of research findings into clinical practice. The project, 'Collaboration for Leadership in Applied Health Research and Care' (CLAHRC) is a National Institute for Health Research funded trial sponsored by the University of Nottingham, with matched funding from Nottinghamshire Healthcare NHS Foundation Trust. At the commencement of the trial there were nine such CLAHRCs across the UK focusing on a range of research topics including diabetes and health anxiety. The CLAHRC from which participants in the depressed samples were recruited for this PhD study focused on the treatment of moderate-severe depression. The CLAHRC compared treatment as usual (TAU) to a specialist depression service delivering intensive and expert pharmacotherapy and psychotherapy over the course of 12 months. Participants were then followed up for an additional 18 months. The author was employed as a cognitive therapist within the trial.

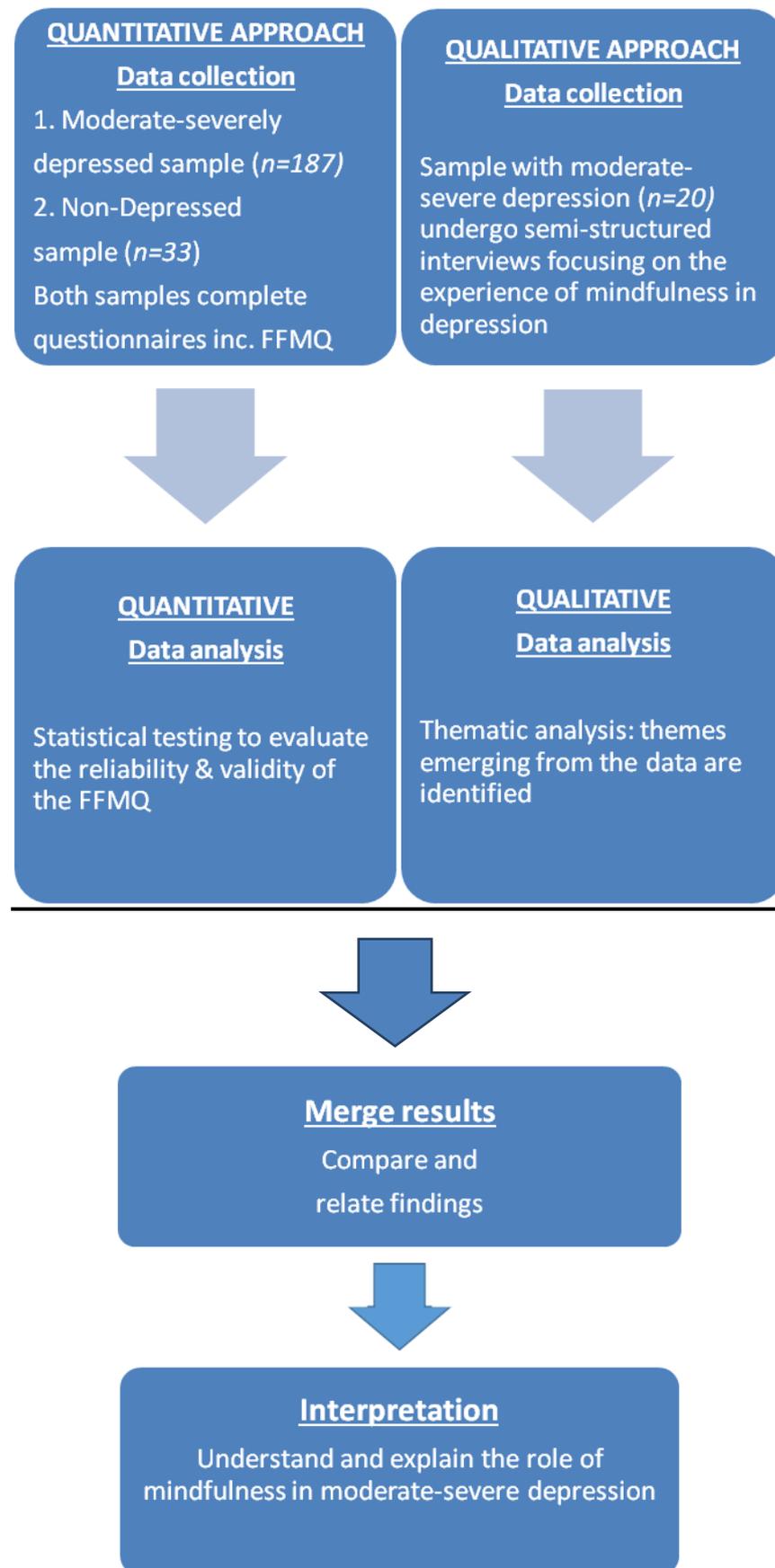
Probabilistic sampling was used in the selection of participants and the power calculation for the CLAHRC RCT established that 148 participants was optimum for this to draw accurate and reliable conclusions. Trial

design and procedures are detailed in full elsewhere (Morriss et al., 2010).

3.5 Study design

Whilst the study described in this thesis was embedded in the CLAHRC, it is a separate study (a PhD study) that has distinct aims and objectives as identified in the final section of chapter two. The mixed methods design for this study is a convergent parallel design (Creswell & Plano-Clark, 2011). It involves collecting and analysing two independent strands of quantitative and qualitative data in a single phase; merging the results of the two strands and then looking for convergence, divergence, contradictions or relationships between the two datasets. The study design is represented diagrammatically in figure 4 below.

Figure 4. Convergent parallel mixed methods design



As illustrated in figure 4 above the convergent parallel design utilised in this study involves a combination of both quantitative and qualitative approaches. The quantitative approach addresses objective 1 of the study and the qualitative approach addresses objective 2. The combined results of these are intended to provide a more complete understanding of the experience of mindfulness in moderate-severe depression than currently exists.

The qualitative approach employed semi-structured interviews to capture participants' experience of mindfulness during episodes of depression. Qualitative research methods share a common intention to understand participants' point of view and may therefore positively influence clinical practice and treatments in ways that would not be possible if using only quantitative means (Williams et al., 2011). Thematic Analysis (Boyatzis, 1998) is one such approach that has become increasingly established as a research method in the last decade (Braun & Clarke, 2006). The qualitative phase of this study uses thematic analysis to more fully understand the experience of mindfulness in participants drawn from the CLARHC RCT with moderate-severe levels of depression. The quantitative approach utilised a methodological study, an approach frequently used to develop and evaluate research tools such as the FFMQ. Methodological studies aim to establish the validity and reliability of instruments in an effort to ensure they accurately measure constructs that are used as variables in research (Polit & Beck, 2008). This involves the use of psychometric testing, which addresses measurement of

psychological facets (Polit & Beck, 2004), drawing upon measurement theories, within two broad approaches, Classical Test Theory (CTT) and Modern Test Theory (MTT), often referred to as Item Response Theory (IRT: da Rocha et al., 2013). Whilst IRT focuses on individual item scoring allowing for additional forms of testing e.g., differential item functioning, it is most appropriate for unidimensional measures and requires larger samples than CTT, which may be considered an appropriate choice for psychometric testing involving assessment of scale structure via confirmatory factor analyses (da Rocha et al., 2013), as utilised in the current study. Assessment tools that have not been rigorously tested may lack sufficient psychometric properties and consequently produce spurious or misleading results. As stated in the previous chapter, the psychometric soundness of the FFMQ has yet to be evaluated with participants experiencing moderate-severe depression. The quantitative strand of this study addresses this important omission in the literature by conducting reliability and validity testing of the FFMQ with this sample. This includes analyzing and comparing FFMQ responses, assessing internal consistency, analysis of correlational patterns and examining the factor structure via Confirmatory Factor Analysis.

3.5.1 Principles underlying reliability and validity testing

Before the validity of the construct contained within a questionnaire can be established it is necessary to be confident that it is reliable. This study evaluates the FFMQ for two types of reliability: internal consistency and

test retest reliability. Internal consistency reliability refers to the degree to which scale items relate closely to each other, thereby consistently representing the construct the questionnaire aims to capture. Internal consistency reliability is thus an essential prerequisite of construct validity as correlations between the scale and other constructs will be limited by this, due to the impossibility of a scale correlating more highly with anything other than itself (Kline, 2000).

Test retest reliability involves determining whether a measure obtains similar results when repeated with the same sample, as measured by the correlation coefficient. The scale is given at two time points and the correlation between the two scores calculated. These range from -1 to +1, with a score as close to +1 as possible representing identical scoring at both time points. Scores above 0.7 are identified by Kline (2000) as denoting acceptable test retest reliability. A Pearson correlation coefficient will be used to assess the strength of the relationship between the measure taken at T1 and following a six month gap, at T2, indicating whether the measure is sufficiently reliable over time.

Whilst establishing reliability is a prerequisite for investigating the validity of a questionnaire, additional tests are necessary to establish its validity. Validity refers to the degree to which the questionnaire accurately captures the construct under investigation, and construct validity has been defined as the accuracy with which a test measures a theoretical construct or trait (Anastasi & Urbina, 1997). It has been described as a

central concept in psychology (Westen & Rosenthal, 2003) and is recognised as existing on a continuum, rather than consisting as an all or nothing determination (Beck & Gable, 2001). It is particularly necessary when there exists no absolute consensus about the qualities of the attribute being measured (Cronbach & Meehl, 1955), as in the current study which examines the relationship between constructs including mindfulness and depression. Whilst psychological processes such as mindfulness are recognised as elusive, it is argued that it is possible to draw conclusions about the accuracy of the construct based on correlational patterns between this and other, related constructs, and that these constitute evidence beyond “*pure speculation*” (*ibid.*, p.285). If the results of correlational patterns are consistent with predictions, then these provide some support for the construct validity of this (Kline, 2000), though this can never be proven and can only be said to demonstrate validity for the population included in the study.

As a complex and multi-faceted construct, mindfulness can benefit from investigation at the facet level (Baer et al., 2006). Exploration of individual FFMQ facets and their relationship with other variables may lead to a more accurate understanding of the construct. For example, such investigation may reveal that individual facets are disproportionately influential in determining the relationship between mindfulness and other constructs, a fact that would be hidden if viewing only total scores of the FFMQ. This study evaluates the construct validity of the FFMQ, and includes correlational analyses. This involves using the correlation

coefficient to measure the strength of the relationship between facets of mindfulness and other related variables namely: depression, experiential avoidance, self-compassion and rumination.

A further method of psychometric evaluation of test instruments such as the FFMQ is Confirmatory Factor Analysis (CFA). In essence, CFA involves clarifying the existence of identifiable factors within a scale. This is ascertained via statistical analysis of patterns of scoring for individual scale items revealing to which factor the item belongs. The pattern of item-factor relationships is termed factor loadings (Brown, 2015). CFA is typically employed after a tentative factor structure has been identified using Exploratory Factor Analyses (EFA) during the development of a scale (Brown, 2015). Following identification of this, CFA further investigates the accuracy and stability of the proposed factor structure. An example of the use of CFA is the development of the FFMQ: 112 items from all pre-existing mindfulness questionnaires were subjected to EFA and factor loadings indicated that a five factor model was most suitable. The 39 items in the resulting five factor model – the FFMQ – were subsequently subjected to CFA confirming a five factor structure. Together, these five factors are proposed to constitute an overarching construct of mindfulness, indicated by the finding that all items loaded significantly onto an overarching factor of mindfulness.

The steps undertaken to complete reliability and validity testing of the FFMQ in moderate to severe depression are outlined in the following section of this chapter.

3.6 Quantitative approach: Investigating the psychometric properties of the FFMQ

3.6.1 Sample and inclusion/exclusion criteria

The sampling methods for quantitative and qualitative approaches differ due to their distinctive aims (Polit & Beck, 2004). In the quantitative approach the aim is typically to select a sample representative of the target population so that inferences can be made about this population (Polit & Beck, 2004). As it was not feasible to recruit people from all areas of the UK, the sampling frame in the current study contained people accessing secondary care mental health services in Nottinghamshire, Derbyshire and Cambridgeshire, who despite receiving treatment for a minimum of six months, continued to experience at least moderate levels of depression. Sampling methods in qualitative research typically focus on enabling a deeper understanding of the phenomena of interest (Patton, 2001). The qualitative approach in this study involved purposive sampling in which a subset of participants was selected in order to gather views about mindfulness in those naïve to mindfulness training.

Non-depressed sample

The non-depressed group consisted of a sample of adults (n=33) recruited to act as a contemporaneous healthy comparison to the depressed sample. These were drawn from university staff, CLAHRC associates and health trust staff. CLAHRC associates are people with an interest in depression and depression research and who indicated a wish to be involved in the CLAHRC project. Involvement typically included attendance at events, or receipt of email updates about the project. This included a variety of people both from within healthcare and university services, and also from the general public. Participants were purposively selected to reflect the age and gender characteristics of the depressed sample identified below and in table 15. The mean age of participants was 48.7 and 51.5% were female. Inclusion criteria were: being free of current or historical depression as assessed by the SCID and HAMD; aged 18 years or older. Exclusion criteria were: current episode or history of depression or other mental disorders except for mild and transient anxiety in the context of a life event.

Depressed sample

Participants (n=187) in this group were receiving treatment in secondary mental health services from community mental health teams, out-patient and in-patient units in three mental health trusts across Nottinghamshire, Derbyshire and Cambridgeshire. The responsible health care professional considered the participant to be experiencing a primary unipolar depressive disorder that was not secondary to any other mental

disorder. They had been offered or received direct care for depression from one or more health professionals in the preceding six months but remained depressed despite this ongoing treatment. The sample aimed to be representative of a population experiencing significant levels of depression, as identified through structured interviews and well validated questionnaires. Participants mean age was 46.6 and 61.5% were female, with a mean duration of depressive disorder of 16.7 years (range 1-49 years). Inclusion criteria were: meeting criteria for at least moderate depression (five out of nine symptoms of depression: NICE, 2004); a minimum Hamilton Depression Rating Scale score of 16 indicating at least moderately severe depression (Hollyman et al., 1988); a score of 60 or less on the Global Assessment of Functioning Scale (GAF: Hall, 1995) indicative of significant social and occupational impairment; good working knowledge of English; an ability and willingness to provide oral and written informed consent to participation in the study; aged 18 years or older. Exclusion criteria were: receiving emergency care for suicide risk, risk of severe neglect or homicide risk; however, patients were not excluded because of such risk provided the risk was adequately contained within their current care setting and the primary medical responsibility for care remained with the referring team; unable to speak fluent English; was pregnant; experiencing unipolar depression secondary to a primary psychiatric or medical disorder.

The 187 participants recruited across the three sites substantially exceeds Kline's (2000) suggested minimum conditions of at least 100

participants from a representative sample for accurate evaluation of psychometric properties including test retest reliability and also for internal consistency, which is considered a prerequisite for adequate construct validity.

3.6.2 Sample and recruitment

Non-depressed sample

Non-depressed participants were recruited through poster and leaflet advertising (see Appendices 2 & 3) in and around the University of Nottingham and Nottingham NHS Trust Healthcare sites. Emails including this information were also sent to all CLAHRC associates, inviting them to participate in the study. Those interested contacted the author or a fellow PhD researcher (AG) via email and were then sent a participant information sheet providing further information about the study and involvement in this (see Appendix 4). Following a minimum period of 24 hours participants were then contacted via email or telephone to clarify if they wished to be further involved in the study. If participants' wanted to pursue inclusion in the study, a telephone call was arranged to screen for basic inclusion criteria, prior to meeting to conduct a full assessment. During this telephone call obvious excluders were assessed, including active or historical episodes of depression or significant mental disorders (see Appendix 5). Where participants met criteria for the study a meeting was arranged to complete the consenting process (see Appendix 6) and conduct the full assessment. Participants

were given an inconvenience allowance in the form of a £5.00 internet shopping voucher.

Depressed sample

Participants were recruited from general practitioners, community mental health teams, mental health out-patient clinics and self-help groups.

Participants were typically approached by someone from their usual care team, which at times included investigators within the CLAHRC RCT.

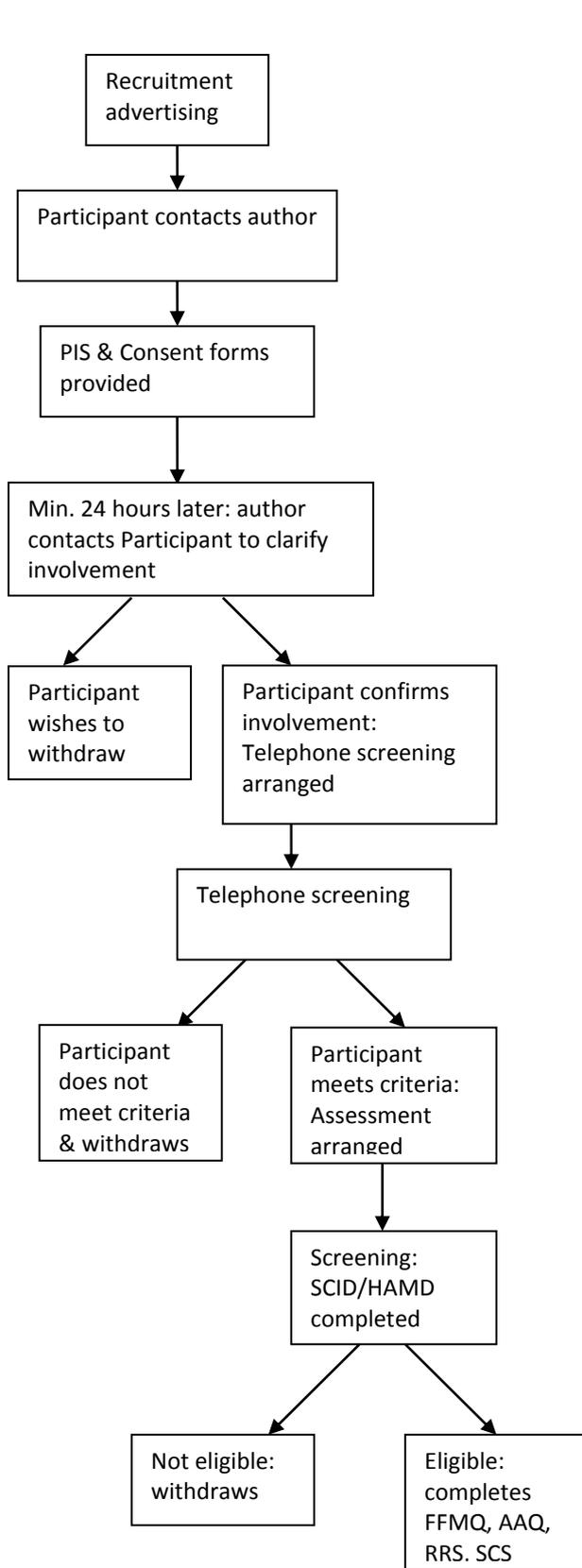
Trial information was displayed in clinical areas and within self-help groups, mental health drop-in and day centres and homeless centres.

Participants were able to contact the research team directly to pursue enrolment in the study but the appropriateness of their participation was then confirmed with their health care worker. Following provision of written information about all aspects of the study willingness to participate was determined via a meeting with a CLAHRC RCT researcher. Following obtaining of consent eligibility for the study was formally assessed.

Study recruitment and data collection procedures for study samples are summarised in figure 5 below.

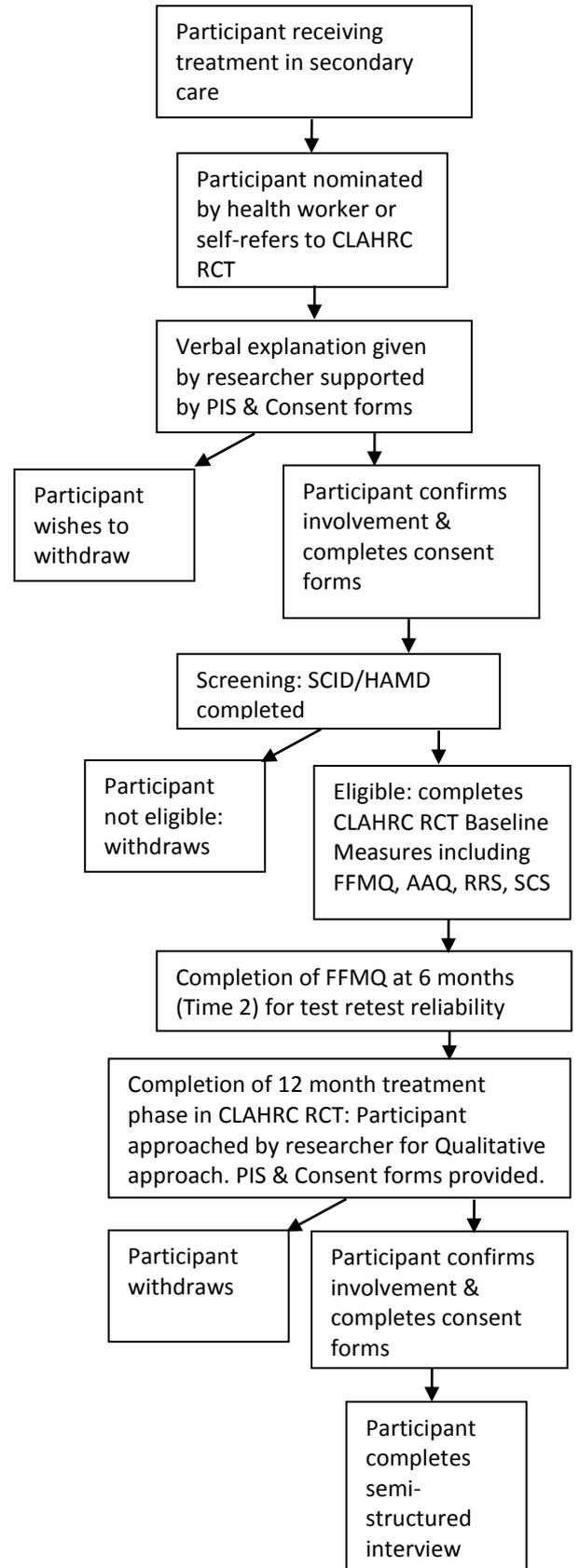
Figure 5. Flow of participants in quantitative and qualitative approaches

Non-depressed sample



PIS=Patient Information Sheet

Depressed samples



3.6.3 Ethical considerations

Ethical considerations in research have, and should continue to be, a critical aspect of this endeavour (Streubert & Carpenter, 1999). Ethical considerations in research have not always been prioritised (e.g., the Tuskegee syphilis experiment, running from 1932-1972) and it is the responsibility of those undertaking research to ensure that the rights of individuals participating in this are protected (Polit & Beck, 2004).

Recruitment and study procedures were conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki, 1996; the principles of Good Clinical Practice (ICH-GCP, 2012), and the Department of Health Research Governance Framework for Health and Social care, 2005. It was subject to Multi Centre Research Ethics Approval and local Trust research governance approval.

3.6.4 Data management

All researchers involved in this study were required to act in accordance with the Data Protection Act, 1998. Participants' files contain the least information necessary for the purposes of the study. Files were stored in a locked room, and locked cabinet. Information was limited only to study investigators and relevant regulatory authorities. Computer held data was held securely and password protected on University of Nottingham and Nottinghamshire Health Trust computers and data was stored on a secure dedicated web server. Information contained in medical records was also securely stored and treated confidentially consistent with other confidential medical information. The disclosure of participants' medical

information gathered in the course of this study was prohibited due to its explicitly confidential nature. The only exceptions included the participant's medical team and all appropriate medical personnel responsible for the participant's welfare. The use of participant identification code numbers further enhanced anonymity. However, the Research Ethics Committee (REC), the University of Nottingham representatives, local R&D Departments and the regulatory authorities, were able to request to see data that had been generated as a result of this trial.

3.6.5 Informed consent

Voluntary informed consent is a prerequisite for participants to engage in healthcare research (Medical Research Council, 2005). Potential participants should be confident that refusal to be involved in research will not negatively prejudice existing treatment and that they may withdraw from the study if they wish (Polit & Beck, 2004). It was therefore emphasised to participants that consent could be withdrawn at any time with no removal of benefits to which the participant is entitled or adverse effect to the quality of any future medical care. Participants were also clearly informed that involvement in the study was completely voluntary but that should they wish at any stage to withdraw from this that any data already collected could not be erased and might be included in the final analyses.

3.6.6 Ethical approval

The study was approved by the Multi Centre Research Ethics Committee (REC) Approval and local Trust research governance approval (Trial registration: NCT01047124; REC Reference: 09/H0405/42. Recruitment to the study only commenced following approval of the final protocol and associated material by the REC (see Appendix 7).

3.6.7 Measures

The Structured Clinical Interview for DSM-IV Diagnosis (SCID), and the Hamilton Rating Scale for Depression (HAMD) were used to ensure that participants recruited to the CLAHRC study either had depression as a primary diagnosis (depressed sample), or were free of current, historical depression or other significant mental health problems (non-depressed sample). Each participant then completed a set of self-report questionnaires in order to carry out correlational analyses as part of construct validity testing of the FFMQ. Information about these instruments and predictions about correlational analyses are provided below.

3.6.7.1 The Structured Clinical Interview for DSM-IV Diagnosis for axis 1 disorders (SCID)

The SCID (First et al., 2002) has been used in over 700 published studies in which this was the basis for diagnosis, and many studies use the SCID to assess the accuracy of clinical diagnoses (e.g., Shear et al.,

2000; Steiner et al., 1995). It was carried out at baseline and involves engaging participants in a semi-structured interview to determine the presence or absence of mental disorders including depression, anxiety disorders and other mental health problems using well established diagnostic criteria. Questions seeking to identify the presence of depression include “Did you lose interest or pleasure in things you usually enjoyed?” and “During this time, were you depressed or down, most of the day nearly every day?” Completing the SCID takes between one and two hours for the clinical sample and 45-90 minutes for the non-depressed sample.

3.6.7.2 Hamilton Rating Scale for Depression (HAM-D)

The HAM-D (Hamilton, 1960) is a 17 item observer rated scale measuring severity of depression. Questions focus on areas of mood, insomnia, agitation or retardation, feelings of guilt, suicidal thoughts, anxiety, somatic symptoms and weight loss. Scale items are weighted towards somatic symptoms of depression (Thompson, 1989). Eight items are scored on a 5-point scale, ranging from 0 = not present to 4 = severe. Nine are scored from 0-2. Item scores are summed to give a total score. Total scores range between 0-7, as signifying normal mood, 8-13 mild depression, 14-18 moderate depression, 19-22 severe depression and scores of 23 or above indicating very severe depression. Suggested prompting questions for the interviewer when assessing depressed mood include, “Have you been feeling down or depressed?” and “How long have you been feeling this way?” High inter-rater reliability ($r = 0.90$) has

been found in several studies using this scale (e.g., Hamilton, 1960), and analyses indicate that the scale possesses good internal consistency with Cronbach's alpha scores above 0.70 (Thompson, 1989). The scale has been found to differentiate successfully between levels of depression (Carroll et al., 1973) and has demonstrated concurrent validity with other observer rating scales of depression (Kearns et al., 1982). In addition to acting as a screening tool for inclusion in the study, the HAMD was also used in correlational analyses with the FFMQ. All facets of the FFMQ were expected to significantly correlate negatively with depression, except for the facet Observe. It was also predicted that the strongest correlation would be with the facet Nonjudge for both samples.

3.6.7.3 Five Facets Mindfulness Questionnaire (FFMQ)

As described above, the FFMQ (Baer et al., 2006) is a 39 item measure which conceptualises mindfulness as a multifaceted construct, involving the capacity to notice and articulate experience without efforts to escape or judge it, thus enabling greater awareness of experience in day to day life. The five facets are labelled: Observe, Describe, Nonjudge, Nonreact and Actaware. A Likert scale between 1 = "Never or rarely true" to 5 = "Very often or always true" is used to complete item scores. Items are summed to provide a total score, indicating level of mindfulness. Individual facet scores can also be calculated. Previous testing of this measure indicates acceptable internal consistency reliability with Cronbach's alpha scores in excess of 0.70 (e.g. Baer et al., 2006) and

support for the validity of this construction of mindfulness (e.g. Baer et al., 2008).

3.6.7.4 Self-Compassion Scale (SCS) “How I typically act towards myself in difficult times”

The SCS (Neff, 2003) is a 26 item self-report measure of self-compassion consisting of six subscales making up an overarching construct of self-compassion. MacBeth and Gumley (2012) report in their meta-analysis of self-compassion and psychopathology that the SCS is the most frequently used compassion scale with studies of this construct. Subscales and example items include: Mindfulness “When something upsets me I try to keep my emotions in balance”; Isolation “When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world”; Over identification “When I fail at something important to me I become consumed by feelings of inadequacy”; Self-kindness “I try to be loving towards myself when I’m feeling emotional pain”; Common humanity “When things are going badly for me, I see the difficulties as part of life that everyone goes through”, and Self-judgement “I’m disapproving and judgmental about my own flaws and inadequacies”. A Likert scale between 1 = “Almost never” to 5 = “Almost always” is used to complete item scores. The total score is then divided by the number of items to provide a mean score. All subscales had internal consistency reliability scores above 0.70 in the original validation study of the SCS (Neff, 2003a). Internal consistency of the total scale was found to be excellent with a with a Cronbach’s alpha

score of 0.92. Pearson's correlation coefficient (r) scores supported construct validity with the SCS demonstrating a negative relationship with self-criticism and positive correlations with mood and social connectedness. The SCS also demonstrated predictive validity, significantly predicting mental health outcomes. In this study it was predicted that all facets of the FFMQ would be significantly positively correlated with the SCS in both the depressed and non-depressed samples. It was also predicted that the strongest correlation would be with the facet Nonreact.

3.6.7.5 Acceptance and Action Questionnaire (AAQ)

The AAQ (Hayes et al., 2004) aims to capture a construct of experiential avoidance as conceptualised within Acceptance and Commitment Therapy (ACT) and Relational Framework Theory. It is a measure of unhealthy efforts to control or suppress unwanted experiences such as distressing thoughts and emotions. An example item from the scale includes the statement "I am able to take action on a problem even if I am uncertain what is the right thing to do". A Likert scale between 1 = "Never true" to 7 = "Always true" is used to complete item scores. Items are summed to provide a total score. A number of versions exist of the measure, consisting of between 9-16 items depending on its use (Bond et al., 2011). Initial testing of the 9 and 16 item version found satisfactory internal consistency and convergent, discriminant, concurrent and incremental validity (Hayes et al., 2004). However, internal consistency and test retest reliability were found to be inadequate in some

subsequent studies (Bond et al., 2011). The 16 item version (Hayes et al., 2004) is used in this study due to superior internal consistency reliability compared to the 9 item version. Due to some of the psychometrically unstable qualities as described above, a new version of this measure, the AAQ-II has been developed which purports to have sounder reliability and validity (Bond et al., 2011). However, this measure was still in development at commencement of this study and the AAQ-16 has therefore been utilised. It was predicted that all facets of the FFMQ would show a significant negative correlation with the AAQ in both samples, except for Observe whose relationship was expected to be non-significant. It was further predicted that the highest correlation coefficient would exist between the facet Nonjudge and the AAQ, which was expected to demonstrate a strong relationship in both samples.

3.6.7.6 Ruminative Responses Scale (RRS)

The RRS (Treyner et al., 2003) is a 22 item scale drawn from the Response Style Questionnaire (RSQ: Nolen-Hoeksema, 1991) which is based on Nolen-Hoeksema's Response Styles Theory. The RRS assesses the degree to which participants repetitively focus on the origins, meaning and consequences of their negative mood (Miranda & Nolen-Hoeksema, 2007). A Likert scale between 1 = "Almost never" to 4 = "Almost always" is used to complete item scores. Items are summed to provide a total score. Recent investigations into the psychometric properties of this scale showed that several items were confounded with depression (Treyner, Gonzalez & Nolen-Hoeksema, 2003). In addition to

the 12 item factor of 'Depression-related rumination', testing within this study indicated that the questionnaire contains two, five item subscales: Reflection (focusing on internal events in order to understand and problem solve low mood) and Brooding (the tendency to passively dwell on one's current versus desired state), each with satisfactory alpha coefficients of 0.72 and 0.77 respectively. The instructions for RRS completion guide the participant to indicate what they generally do when their mood is depressed. The Brooding subscale includes the following example item "Think about all your shortcomings, failings, faults, mistakes". An example item from the 'Reflection' subscale includes "Write down what you are thinking about and analyze it". Both subscales Reflection and Brooding were found to correlate significantly with current depression. It was predicted that all facets of the FFMQ would be significantly negatively correlated with the RRS across both samples, except for the facet Observe whose relationship was expected to be non-significant. The strongest correlation was predicted to be between the facet Nonjudge and the RRS, and of moderate strength.

3.6.7.7 Beck Depression Inventory 1 (BDI)

The BDI (Beck et al., 1961) is a self-rated measure using 21 items scored between 0 – 3 to produce a total score indicating severity of depression. This measure is derived from Beck's cognitive theory of depression and therefore includes items reflecting cognitive aspects of depression, rather than focusing predominantly on somatic symptoms, as in the HAMD. An example scale item referring to feelings of sadness

offers options ranging from “I don’t feel any worse than anybody else” to “I blame myself for everything bad that happens”. Score range is from 0-63. The scores can be categorised into four levels of severity (Beck et al.,1988): non-depressed (<10), mild (10-19), moderate (20-29), and severe level of depressive symptoms (>30). Initial studies found that the BDI demonstrated reliability with psychiatrist ratings of severity and sensitivity to change (Beck et al., 1961). Adequate internal consistency of the scale has also been found with Cronbach’s alpha scores above 0.70 (Schwab et al., 1967). Correlations between the BDI and FFMQ were expected to show the same pattern as those with the HAMD.

3.6.8 Data collection

Non-Depressed sample

Where participants appeared to meet criteria for the study a meeting was arranged to collect data, lasting between 60-90 minutes during. Assessment of participants took place in their own homes, health trust or university site depending upon the preference of the participant. Assessments were conducted by the author or AG, both of whom are experienced and highly trained registered mental health nurses.

During the data collection meeting, participants were identified as experiencing an absence of depression either currently or historically. The absence of any other significant presence or history of mental disorders as defined within the DSM-IV was further identified during assessment. This was clarified through completion of the Structured

Clinical Interview for DSM-IV Diagnosis (SCID) and a HAMD score of 7 or below. Following completion of the SCID and the HAMD and identification of eligibility for further inclusion in the study, participants then completed self-report questionnaires as listed above. Instructions were provided for the completion of the self-report questionnaires and the researcher was available to answer questions relating to these throughout their completion. Data was collected at one time point only.

Depressed sample

Data used in this study had already been collected within the CLAHRC RCT. Completion of assessment tools took between 45 minutes-2 hours. Assessments of participants took place in their own homes, referring team sites or at the university site depending upon the preference of the participant.

3.6.9 Data analysis

The data analysis plan involved cleaning and preparing the data prior to analyses. Descriptive statistics were followed by tests of reliability and validity in the form of confirmatory factor analyses and examination of correlational patterns between the FFMQ and related variables. Steps in the data analyses plan are outlined below

3.6.9.1 Data preparation and preliminary analyses

Data was prepared in order to carry out preliminary analyses, involving reviewing paper copies of completed questionnaires and checking for accuracy against data entered into the initial Excel spreadsheet. Where necessary, items were reverse scored and if relevant divided into subscales and a total score calculated. Excel spreadsheet files were converted into SPSS (Version 22) and Mplus (Muthen & Muthen, 2012) enabling analyses to be conducted. Preliminary analyses were conducted in order to prepare and cleanse the data and checks for normality and underlying assumptions about the sample were carried out. Descriptive statistics were calculated to provide information about participant characteristics prior to conducting reliability and validity testing.

In correlational analyses (SPSS), where more than 30% of scores/values were missing for either a subscale or a total scale for a given participant, this participant was removed from the respective analysis. Where less than 30% of scores/values were missing these were dealt with using the 'Pro Rata' method for obtaining the average score for the participant on that variable. For the rest of the analyses any missing scores/values were imputed as part of the Mplus process (Muthen & Muthen, 2012).

3.6.9.2 Reliability testing

Internal consistency reliability of FFMQ facets and total scale was assessed for both samples with Cronbach's alpha coefficients and was

also evaluated via split half reliability testing, Guttman split half and Spearman Brown coefficients.

Test retest reliability of the FFMQ was conducted with the depressed sample using Pearson's Correlation coefficient to measure the strength of the relationship between scores at Time 1 and after a 6 month gap, at Time 2. Whilst this period exceeds a consensus of test retest measurement occurring within 3 months (Maltby, et al., 2010), there is no agreed standard time period and the retest time period within this study was predetermined by the data collection time points within the CLAHRC RCT. Values above 0.7 were considered to indicate adequate internal consistency and 0.7 for test retest reliability (Kline, 2000).

3.6.9.3 Confirmatory Factor Analysis – testing the factor structure

Construct validity of the FFMQ in a moderate-severely depressed sample was examined by investigating the stability of its factor structure. This was assessed via Confirmatory Factor Analyses (CFA), using the software package Mplus (Muthen & Muthen, 2012). In CFA, several fit indices may be used to determine the extent to which covariances among items are accounted for by the suggested factor model. Among these are included the chi-square statistic involving observing changes in chi-square values between models assessed, with smaller values indicating improved fit. However, large samples have been found to produce changes in chi-square values that whilst statistically indicating change, actually reflect only trivial differences (Chen et al., 2005;

Vandenberg & Lance, 2000; Wen et al., 2004). Therefore, a number of additional measures of fit were utilised. These included the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the root mean square error of approximation (RMSEA; Marsh, Balla & Hau, 1996) and the Akaike information criteria (AIC). By rule of thumb CFI and TLI values greater than 0.90 are believed to indicate a good fit between a model and the data. For the RMSEA a value of 0.05 is thought to indicate close fit, 0.08 a fair fit and 0.10 a marginal fit (Browne & Cudeck, 1993). The AIC was used as a descriptive measure of model parsimony to compare the different models, with reduced values indicating improved fit (Hagenaars & McCutcheon, 2002). CFI is independent of both model complexity and sample size and was therefore used as the primary method for assessing model fit (Chen et al., 2005; Cheung & Rensvold, 2005; Guo et al., 2009).

To replicate the procedure carried out by Baer and colleagues (2006), item parcels rather than individual items were used. Each subscale consisted of three parcels, with 15 parcels in total. Item parcels are described as having several benefits as a means of measuring a construct (Little et al., 2002; Rushston et al., 1983). For example, the reliability of a parcel of items is greater than that of a single item, thereby serving as a more stable indicator of a latent construct (Little et al., 2002). Consisting of a combination of items, parcels provide more scale points, thereby more closely approximating continuous measurement of

the latent construct. Item parcels reduce the risk of spurious correlations, because fewer correlations are being estimated and because each estimate is based on more stable indicators. Parcels have also been shown to provide more efficient estimates of latent parameters than items. Moreover, the object of investigation is not the performance of specific items but rather the relations among the scales.

Analyses were conducted twice with different configurations of item parcels to increase confidence in findings (Little et al., 2002). Parcels were configured with subscale items being first randomly allocated to parcels and then allocated depending on the order in which they appear in the FFMQ (Baer et al., 2008).

To replicate the original study (Baer et al., 2006) and other studies investigating the factor structure of the FFMQ (e.g., Baer et al., 2008; Bohlmeijer et al., 2011; Williams et al., 2014), several factor structures were tested. This initially included testing a unidimensional model and also a five factor model comprising five distinct but correlated mindfulness factors. However, this will not test whether the five factors are elements of an overarching mindfulness construct. To evaluate this, a second order, hierarchical model was tested to determine to what extent all factors load onto an overall mindfulness factor. Finally, due to findings from studies indicating the acceptability of a four factor model for a sample of people without meditation experience (e.g., Baer et al.,

2006; Williams et al., 2014), a second order, hierarchical model was tested with all factors excluding Observe.

3.6.9.4 Criterion related validity: Correlations between FFMQ and related constructs

The construct validity of the FFMQ was further examined by investigating the relationship between this and other constructs captured by measures identified in the previous section of this chapter (depression: HAMD & BDI; rumination: RRS; experiential avoidance: AAQ; self-compassion: SCS). The relationship between these variables was calculated using Pearson's correlation coefficient (r). Scores between 0.5 and 1.00 are considered strong, between 0.30 and 0.50 considered moderate, and <0.3 considered small or weak (Cohen, 1988). The strength and direction of correlations may undermine or support the validity of this construction of mindfulness with a sample of participants with moderate-severe depression and predictions about these have been identified in chapter two.

3.6.9.5 t-test: FFMQ responses of two samples

An independent samples t-test was carried out, to determine whether FFMQ scores were able to differentiate groups and so provide evidence of additional construct validity. It was predicted that a statistically significant difference would be found between samples.

3.6.10 Quantitative approach: Summary

A stated objective of this study is to investigate the psychometric characteristics of the FFMQ in a sample yet to be evaluated in this way – participants with moderate-severe depression. The quantitative strand of this study addresses this objective via a methodological investigation of the FFMQ's internal consistency and test-retest reliability prior to evaluating its construct validity using CFA and examination of correlational patterns. Participants and procedures involved in this strand of the study have been described and the following section of this chapter provides information about the other method employed in this study – the qualitative approach.

3.7 Qualitative approach: Exploration of the role of mindfulness in moderate-severe depression

3.7.1 Sample and inclusion/exclusion criteria

A subsample of participants from the CLAHRC ($n=20$) were recruited for this phase of the study and inclusion/exclusion criteria identified in the quantitative section of this chapter also apply to participants included in this component of the study. Participants' characteristics were consequently typified by significant levels of depression that had been in existence for many years. In addition to previously identified criteria, participants with limited knowledge or experience of mindfulness-based approaches were purposively selected and inclusion therefore required that participants had not received mindfulness training. The choice of

purposive rather than convenience sampling was due to an intention to specifically gather views of subjective experience and opinions about mindfulness and depression in those naïve to mindfulness in order to determine whether this concept is spontaneously volunteered as a feature of depressive experience. Convenience sampling may have resulted in a subsample of participants with direct experience of mindfulness, especially given the increasing availability of mindfulness based interventions within local mental health services. After 20 participants had been recruited and interviewed no new topics were being raised, indicating that saturation had been reached. Participant characteristics are summarised in table 13, in keeping with qualitative research guidelines (Tong et al., 2007).

Table 13. Qualitative participant characteristics

	Sample (<i>n</i> =20)
Gender, Women: <i>n</i> (%)	7 (35%)
Age (in years): <i>M</i>	50.6
Severity of depression (HAMD): <i>M</i>	21.9
Duration of depressive disorder (in years): <i>M</i>	20.5

3.7.2 Recruitment

Following completion of the active treatment phase in the CLAHRC RCT (12 months), potential participants were contacted by telephone by a CLAHRC researcher and asked about their willingness to participate in semi-structured interviews exploring their experience of depression. The author met with the CLAHRC researcher prior to recruitment and went through criteria for study participation and information sheets detailing

what this would involve in order to ensure that participants were given accurate information (see Appendices 12 &13). An initial verbal explanation by the CLAHRC researcher was followed by provision of information sheets to assist participants in deciding whether or not to engage in the study. Following this (a period of at least 24 hours) their willingness to participate was determined via a telephone call. If willing, participant details were forwarded to the author and a telephone appointment arranged to further clarify involvement in the study and to arrange an interview.

3.7.3 Data collection

Qualitative data collection and interpretation took place before the quantitative analysis, in order to reduce the possibility of quantitative findings influencing theme analysis.

The methodological approach used to capture the complex and diverse nature of participant accounts was semi-structured interviews. These were conducted over an eight week period in early 2014. All interviews were face to face with the participant and the author – a highly trained mental health professional experienced in working with severe levels of depression and distress. Interviews either took place at the author's clinical office, the participant's home or an alternative location of the participant's choosing, with the need to protect confidentiality additionally informing this selection. When participants became distressed during the interview there was the opportunity to discuss this with the interviewer

and any further necessary support was considered. Interviews were recorded via digital audio recorder and transcribed as soon as possible so that the interviews remained fresh in the researcher's memory. Verbatim transcription is a critical element of preparing data for analysis (Polit & Beck, 2004). Interview pauses, silences and extraneous sounds such as "erm" were included in the text, indicating when participants were thinking in silence, in an attempt to accurately capture the interview (Poland, 1995).

Interviews began with a statement outlining the purpose of the interview. An interview schedule was designed to guide this, though this included flexibility to move away from predetermined questions when appropriate, in keeping with the goals of thematic analysis (Boyatzis, 1998). The following extract from the interview schedule was designed to assist participants in fully detailing their experiences of depression.

"We're meeting today to explore in some detail your experience of depression. The purpose is to get your perceptions about this, so I am particularly interested in hearing about this in your own words. Your perceptions are what matter. There are no right or wrong, desirable or undesirable answers. I would like you to feel comfortable saying what you really think and how you really feel".

Subsequent interview questions were designed to further explore the participant's experience of depression and to identify whether facets of

mindfulness were reported as an element of this. Initial interview questions were very open and general, simply asking about the experience of depression, in order to see whether aspects of mindfulness were volunteered spontaneously as a significant component of this. Example questions are listed below (see Appendix 8 for a full copy of the Interview Schedule):

“Can you describe your experience of depression?”

“Please tell me how depression came to be a part of your life”

“What are the most noticeable changes in your experience since the onset of depression?”

“What are the most prominent aspects of your depression?”

Questions relating to mindfulness were then asked, referring to qualities embodied within facets of the FFMQ, rather than asking directly about mindfulness, in an attempt to ensure questions were not leading or closed, and to gather information about this topic in the participants own words (Polit & Beck, 2004). Example questions include:

“What, if any, impact does depression have on the way you notice things and pay attention to your experiences?”

“Does depression affect the way you react to things? In what way?”

“Please describe how depression affects the way you feel about yourself”

A further short section of the interview consisted of asking participants specifically about their understanding and experience of mindfulness in relation to their depression. Example questions include:

“What’s your understanding of the term mindfulness?”

“What’s your experience of mindfulness when your mood is depressed?”

3.7.4 Data analysis

Transcribed data was analysed using thematic analysis (TA). This method has been developed as an approach for identifying and analysing patterns of meaning within a data set (Braun & Clarke, 2006). TA is a commonly employed approach within psychology that has recently become recognised as a qualitative analytic method in its own right (Braun & Clarke, 2006). Focusing on the identification of themes in a data set, it involves a skill common to all qualitative research (Holloway & Todres, 2003) and is therefore arguably the first method of analysis that all researchers should learn (Braun & Clarke, 2006).

Alternative qualitative approaches including phenomenology and grounded theory may have allowed for more open exploration of participants experience and a method of analysis initially considered for this study was Interpretive Phenomenological Analysis (IPA). This methodology has been developed by Smith, Harre & Van Langenhove, (1995) to allow in-depth investigation of subjective experiences that emerge spontaneously within interviews (Smith, Flowers & Larkin, 2009). It is not designed to test a predetermined hypothesis but instead aims to explore in detail an area of interest (Smith & Osborn, 2003). However, the aim of the qualitative strand of this study was to gather data in order to more fully investigate the role of mindfulness in depression. More explicit questioning relating to this curtailed opportunities for other, potentially important aspects of participants' experience to emerge. This more focused and theory driven approach is in contrast to IPA and as a result of this thematic analysis became the chosen method of analysis for this study.

In TA themes can be identified inductively or deductively (Frith & Gleeson, 2004). Inductive themes emerge directly from the data itself, whereas themes identified deductively relate to a predetermined model or theory. Theme identification in this strand of the study is primarily deductive as interview questions and subsequent analysis related to existing theories of mindfulness and depression (Baer et al., 2006, Segal et al., 2002). TA is a method for investigating the interpretations and meanings that individual's give to their experiences (Boyatzis, 1998), and

consequently overlaps with theoretical underpinnings of cognitive therapy, which ascribes emotional states, including depression, to initial cognitive appraisals (i.e. interpretations and meanings) of events. Mindfulness has been incorporated into cognitive therapy as an additional vehicle through which to more fully illuminate and understand the individual's internal world. Refinements in cognitive theory have led to a shift away from focusing purely on identifying interpretations to one focusing on altering the relationship to these. Nevertheless, TA, cognitive therapy and mindfulness all represent distinct but related attempts to more fully investigate and comprehend the key constituents of an individual's experience, and can therefore be coherently combined in a study of this nature.

Whilst often regarded as being located within a realist ontological and epistemological position (Roulston, 2001), TA has the flexibility to be compatible with both realist and constructionist paradigms (Braun & Clarke, 2006), and the active role of the researcher in identifying themes within a data set is recognised as an important factor in this approach (Taylor & Usher, 2001). Consequently, a reflective diary was used to highlight the role of the study author on subsequent findings (Smith & Osborn, 2003), describing the experience of conducting research and reflections on the author's possible role in influencing this. For example, elements of this included a bias noted by the author in the early interviews with participants towards ascribing meaning to events in accordance with his cognitive therapy training, potentially narrowing the

focus of interviews and limiting opportunities for themes to emerge. Following this reflection and discussion in supervision, a more open stance to questioning was able to be adopted and the interview schedule altered to assist this.

An additional number of features are important in conducting qualitative research if findings are to be credible (Streubert & Carpenter, 1999). Credibility relates to the degree of confidence that can be felt in the accuracy or truth of findings and interpretations about them (Polit & Beck, 2004). This requires that the relationship between the researcher and the participant needs to be considered (Lincoln & Guba, 1985). Participants were aware of the author's role in the CLAHRC as a trial therapist and it is possible that their own experience within this may have influenced their interview responses. For example, participants may feel compelled to either minimise or exaggerate the intensity of their depressive experiences. Drawing from a range of TAU and active treatment participants sought to reduce the possibility of undue bias resulting from this. As highlighted above, participants were also encouraged to speak fully and honestly about their experiences and it was clear from instructions that the study was not an evaluation of the CLAHRC. Sensitivity (Whitmore et al., 2001) was also required given the personal and frequently distressing content of discussion during interviews, and an urge to conduct therapy in an effort to assist participants' in problem-solving some of the upsetting issues being raised in the interviews was observed in the reflective journal. The author

instead aimed to demonstrate listening skills developed through therapeutic work, embodying empathy, warmth and a non-judgemental stance, in order to assist participants in sharing experiences in an emotionally containing atmosphere. Participants were also asked if breaks were needed or if they wished to continue when visibly upset.

Further checks for credibility that were adopted in the current study include a clear description of procedures used in the research, analysis of all cases included in the data set, taking account of the role of the author in the analysis and relating findings to existing literature. An accurate account of the data gathered using a systematic approach is a priority of TA (Joffe, 2012). As recommended by Braun & Clarke (2006), six stages of analysis were conducted as part of the analysis. These stages are summarized in Table 14 below.

Table 14. 6 stages of thematic analysis conducted by the author

Phase	Description of the process
1. Becoming familiar with the data	Transcription of data. This was followed by reading and re-reading the data and noting down initial ideas
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set. Collating data relevant to each code
3. Searching for themes	Collating codes into potential themes. Gathering all data relevant to each potential theme
4. Reviewing themes	Checking the themes worked in relation to the coded extracts (Level 1) and the entire data set (Level 2). Generating a thematic 'map' of the analysis
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme
6. Producing the report	Selection of vivid, compelling extract examples. Final analysis of selected extracts, relating back of the analysis to the research question and literature. Producing a report of the analysis

Credibility of research findings may be increased through the use of additional researchers so that interpretations are not based on only one individual's perspective (Green & Thorogood, 2004). Several transcripts were reviewed by the author and senior qualitative researchers in an attempt to ensure accuracy and consistency of initial codings (PC: primary PhD supervisor & CB: a university lecturer independent of this study and qualitative researcher specialising in theme analysis). Emerging themes were reviewed for face validity by the author, who is experienced in working with depression and mindfulness, and another experienced healthcare professional in this area (RM, 2nd supervisor), and with reference to relevant depression literature.

A thematic code was developed for each theme identified. In line with recommendations, 5 elements were included in the coding scheme in an attempt to ensure credibility of findings (Boyzatis, 1998). These included:

- A meaningful label
- A definition
- How to know when the theme occurs
- Any qualifications or exclusions to identification of the theme
- Examples of a positive and negative occurrence

The codebook containing this information, an example transcript and codings identified are included for reference as appendices 9-11.

3.7.5 Qualitative approach: Summary

This section has outlined the procedures undertaken to address the second objective of this study – to explore the experience of mindfulness in those with significant levels of depression. The qualitative approach has involved recruitment of 20 people with moderate-severe depression and thematic analysis of semi-structured interviews.

3.7.6 Method chapter: Summary

This chapter has provided information about the quantitative and qualitative methods and procedures employed to address the objectives of this study. These aim to establish the psychometric properties of the FFMQ with a sample against whom it has not been tested (quantitative approach) and explore participants' experience of mindfulness (quantitative approach), in order to fulfil the primary aim of this study: to increase understanding of the role of mindfulness in moderate to severe, persistent depression. The results of each approach are reported in the next chapter.

Chapter 4

Results

Introduction

This chapter presents the results from the quantitative and qualitative analyses carried out in this study. It begins by presenting descriptive statistics and summarising data preparation and preliminary analyses conducted. The results of psychometric testing of the FFMQ including internal consistency and test retest reliability are provided. This is followed by findings of construct validity testing in the form of confirmatory factor analysis and criterion related validity testing via examination of correlations between the FFMQ and depression, rumination, experiential avoidance and self-compassion. Qualitative results are also presented including themes identified from thematic analysis.

4.1 Exploring the FFMQ: Results of psychometric testing with depressed and non-depressed samples

4.1.2 Participant characteristics

Non-depressed sample

The sample consisted of 33 participants of whom 51.5% were females, with a mean age of 48.7 years old. HAMD scores confirm that these were experiencing an absence of depression, with a mean of 1.18, and a

median value of 0.00. The BDI also represented a non-depressed mean score of 1.91, with a median value of 1.00. Mean FFMQ subscale scores ranged between 25.15-35.30 with a total score of 148.55 (see table 15).

Depressed sample

The sample consisted of 187 participants. 61.5% of the total sample were females and the mean age of participants was 46.6 years old. On average, participants had experienced 16.7 years of depressive disorder on entry into the study, with a mean HAMD of 22.60, and a median of 22 indicating a moderately severe level of depression. However, the mean HAMD score is close to the threshold of very severe depression (23) and 82 of the 187 participants (43.85%) scored 23 or above on the HAMD. The mean Beck Depression Inventory (BDI) score of 35 indicates a severe level of depression as measured by this scale (see table 15 below for further details of participant characteristics).

FFMQ mean scores ranged from 19.25-20.49 for all subscales apart from Nonreact which has only 7 items (mean=15.77) whilst the others have 8 items. The FFMQ Total mean was 95.82. The median for all subscales and FFMQ total were close to the mean (within 1-2 points).

Table 15. Participant characteristics for two samples: Non-depressed and Depressed

	Sample	
	Non-depressed (n=33)	Depressed (n=187)
Gender, Women: n (%)	17 (51.5)	115 (61.5)
Age (in years): Mean (SD)	48.7 (10.41)	46.6 (11.39)
Severity of Depression - HAMD: Mean (SD)	1.18 (1.83)	22.60 (5.19)
Severity of Depression - BDI: Mean (SD)	1.91 (1.24)	35.03 (9.04)
Years of Depressive Disorder: Mean (SD)	NA	16.65 (11.32)
Depressed > 1 year n (%)	NA	151 (86.37)
Past major depressive episode:	NA	156 (83.43)

n (%)

FFMQ subscales (n=167*):

Mean (SD)

Observe	25.15 (5.23)	19.95 (5.90)
Describe	31.45 (5.19)	20.49 (6.95)
Nonjudge	35.30 (4.79)	20.08 (6.49)
Nonreact	26.94 (4.68)	15.78 (4.78)
Actaware	29.70 (4.36)	19.25 (5.68)
FFMQ Total	148.55 (13.16)	95.82 (17.74)

* = (n=167) due to missing data

4.1.3 Preliminary analyses: Mindfulness and depression

The data were checked for missing values and data entry errors. There was no missing data for the non-depressed sample – all measures had been completed fully and entered onto excel files without inaccuracies. For the depressed sample, approximately 5% of entered data required correcting across all measures due to inaccurate data inputting from the

paper copies of measures into an excel spreadsheet. All depressed participants (n=187) completed the HAMD and 166 completed the BDI. Of these, 23.49% had missing items which were addressed using Pro Rata method. Following adjustment for missing items, 10.7% of FFMQ cases were removed due to more than 30% of missing scores/values.

In preliminary analyses the data were checked for normality. Scale scores across both samples were generally normally distributed with symmetrical distribution curves as assessed by histograms, normality scores (Shapiro-Wilk), boxplots and levels of skewness and kurtosis. Data exploration therefore showed that this is symmetrically distributed and did not require transformation.

Depression

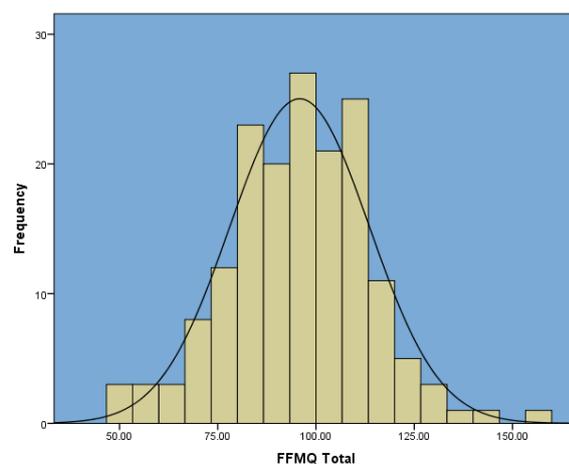
Whilst the distribution curves are negatively skewed (HAMD: 1.838; BDI: 1.025) and platykurtic (HAMD: 3.011; BDI: -0.142) in the non-depressed sample, this reflects the necessarily non-depressed nature of this sample as scale scores predominantly cluster around 0. The depressed sample also demonstrates a positively skewed distribution curve for the HAMD (0.817) as the majority of participants score closer to the entry level scores for moderately severe depression of 16.

Mindfulness

The distribution curve for the FFMQ subscales and total score demonstrate a relatively normal distribution of data, though with some

slight skewness evident for some subscales. For example, the non-depressed sample tend to show a negative skew as scores aggregate towards higher values, whilst there is slight evidence of the opposite feature in the depressed group. Such distributions may be anticipated given the characteristics of each sample and skewness scores ranging from 0.010 (FFMQ Total) to 0.510 (Nonjudge) do not occur to a degree that requires data transformation. Scores of kurtosis also indicate that these fall within an acceptable range between 0.07 (Nonjudge) to 0.57 (FFMQ Total). The depressed sample FFMQ Total score distribution curve is highlighted below for illustrative purposes.

Figure 6. FFMQ Total score: Distribution curve for the depressed sample



4.1.4 FFMQ Reliability: Internal consistency and split half reliability

A primary hypothesis of this study was that the FFMQ would demonstrate acceptable levels of internal consistency and test retest reliability. Results are highlighted in the following section.

Non-depressed sample

FFMQ total internal consistency reliability was measured with a Cronbach's alpha of 0.80, split half reliability values of 0.68 & 0.68, and Guttman split half and Spearman Brown coefficients of 0.79. A comparison of reliability coefficients across both samples is presented in table 16 below.

Depressed sample

The Cronbach's alpha coefficient represents internal consistency for the FFMQ total score of 0.87. Split half reliability ranged between 0.77 for both parts of the FFMQ Total, and a Guttman split half coefficient of 0.88. A Spearman Brown coefficient of 0.88 was found. Individual subscale Cronbach's alpha scores were all above 0.70 as seen in table 16.

Table 16. Cronbach's alpha coefficients for two samples: Non-depressed and Depressed

	Sample	
	Non-depressed (n=33)	Depressed (n=167)
FFMQ subscales:		
Observe	0.74	0.76
Describe	0.84	0.88
Nonjudge	0.83	0.84
Nonreact	0.72	0.82
Actaware	0.76	0.83
FFMQ Total	0.80	0.87

4.1.5 FFMQ Reliability: Test retest

Depressed sample

A correlation coefficient of 0.63 was found between T1 (n=167) and six months later at T2 (n=106), indicating a positive correlation between the measure at both time points.

4.1.6 FFMQ Construct validity: Confirmatory Factor Analysis

Primary hypotheses of this study specified that results of Confirmatory Factor Analyses of the FFMQ would indicate that a five factor correlated (first order) and hierarchical (second order) model would fit the data acceptably well according to fit indices. A further hypothesis identified that all facets, except Observe, would load significantly onto an overarching construct of mindfulness. Results are outlined below.

Construct validity of the FFMQ was examined via Confirmatory Factor Analyses (CFA) using the software package Mplus. Following adjustment for missing values by Mplus analyses were able to be conducted with 173 cases. In keeping with previous testing of the FFMQ (e.g., Baer et al., 2006; Bohlmeijer et al., 2011) a unidimensional model was initially tested. A one factor model has not been supported by fit indices in any prior studies and results indicate a poor fit for this in the current study. Specifically, CFI fell substantially below acceptable level of 0.90 (CFI=0.412). Correlated and second order hierarchical models were tested with the five factor model and a four factor model with the factor

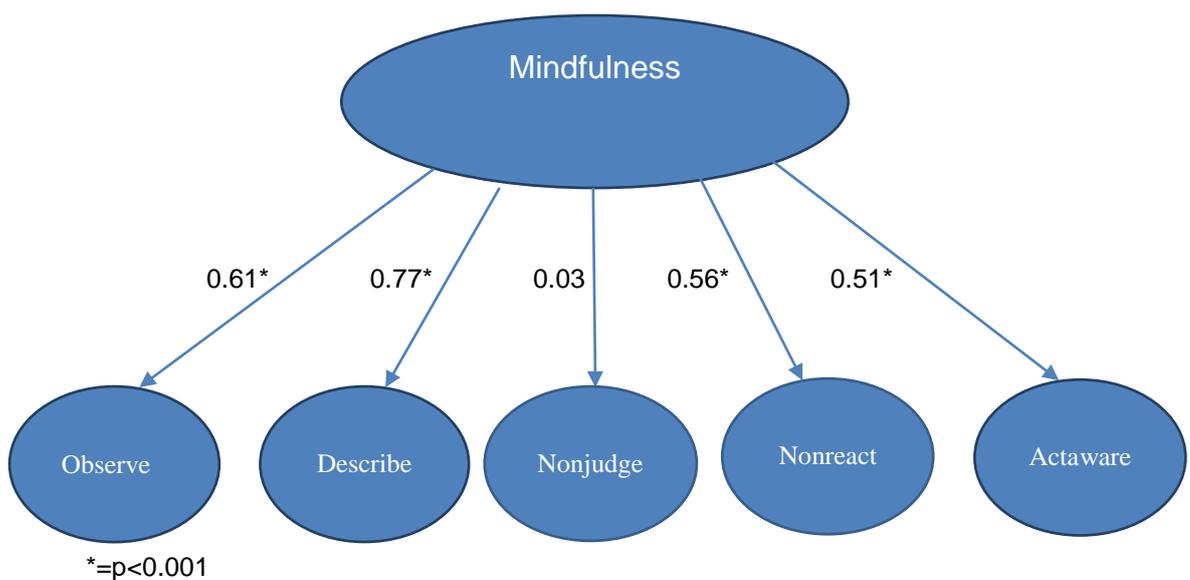
Observe removed due to previous CFA findings highlighted in the literature review. The results of these are illustrated in table 17 below.

Table 17. CFA results: Depressed sample (n=173)

MODEL	DF	χ^2 p value	$\Delta\chi^2$ difference (Δdf), p=	RMSEA	CFI	ΔCFI	TLI	AIC	ΔAIC (Δdif) p=
Five factors	80	130.213 p<0.001		0.059	0.960		0.947	5802.207	
Five factors – hierarchical	85	155.986 p<0.001	25.773 (5) p<0.001	0.068	0.943	0.017	0.930	5817.980	15.773 (5) p=0.007
Four factors (Observe removed)	48	71.120 p<0.017		0.052	0.977		0.969	4597.581	
Four factors – hierarchical (Observe removed)	50	75.961 p<0.010	4.841 (2) p=0.09	0.054	0.974	0.003	0.966	4598.422	0.841 (2) p=0.672

As can be seen from Table 17 above, all four and five factor correlated and hierarchical models fit the data acceptably well according to fit indices. Initial review of these results indicate that a second order hierarchical four factor model of mindfulness with Observe removed is the best fit for the data. However, scrutiny of findings beyond fit indices reveal factor correlations indicating the need for further analyses. Specifically, CFA of the five factor model found that Nonjudge correlated non-significantly with Nonreact and Describe. Furthermore, contrary to predictions, hierarchical analysis indicated that all factors, including Observe, loaded strongly and highly significantly onto the overarching factor of Mindfulness, but that Nonjudge did not as summarised in figure 7 below.

Figure 7. The hierarchical model of mindfulness



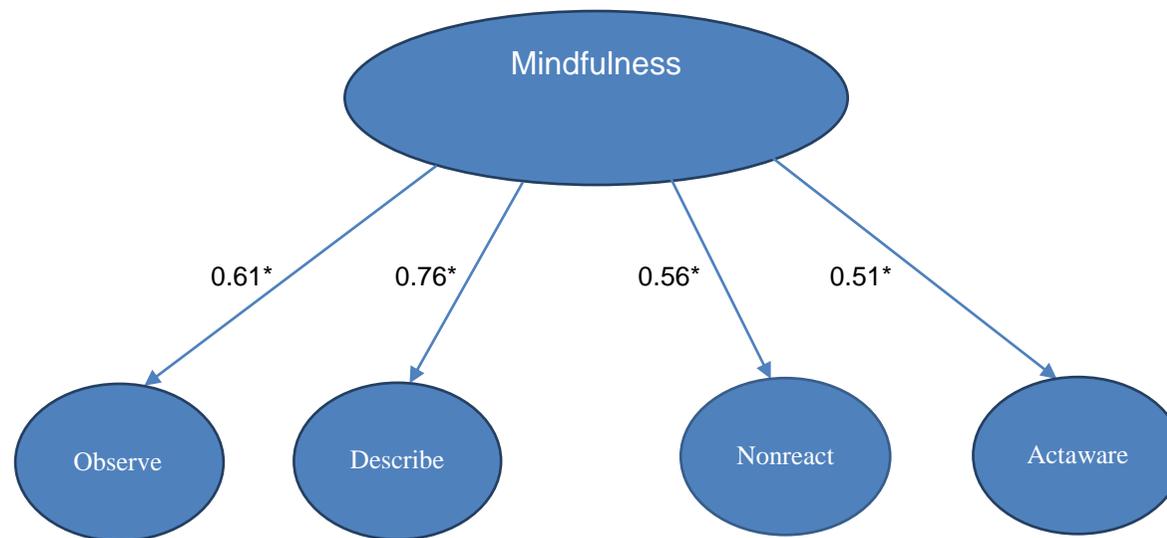
As a consequence of these findings, analyses were repeated but with the facet Nonjudge removed, resulting in some slight improvement in model fit compared to the five factor model. A correlated and hierarchical model are tested as shown in Table 18 below.

Table 18. CFA results: Nonjudge factor excluded (n=173)

MODEL	DF	χ^2 p value	$\Delta\chi^2$ difference (Δdf), p=	RMSEA	CFI	ΔCFI	TLI	AIC	ΔAIC (Δdif) p=
Four factors (FFMQ without Nonjudge)	48	81.214 p<0.001		0.062	0.966		.954	4569.176	
Hierarchical – four factors (FFMQ without Nonjudge)	50	93.563	12.349 (2) p<0.001	0.070	0.956	0.011	.942	4577.526	8.35 (2) p<0.001

Removing Nonjudge from the analysis therefore leads to improved model fit compared to the five factor model. The remaining four factors continue to load strongly and significantly onto an overarching factor of mindfulness with changes in scores predominantly only to the third decimal place. Results are highlighted in figure 8 below.

Figure 8. The hierarchical model of mindfulness – Nonjudge removed



In summary, the four and five factor models tested via CFA indicate that all fit the data acceptably. However, second order analyses reveals that four of the five factors load highly significantly onto an overarching factor of mindfulness whilst the factor Nonjudge does not. The unexpected finding that Nonjudge does not load onto a mindfulness factor makes its inclusion in a measure of mindfulness problematic, given that it appears statistically unrelated to this construct. Results from CFA therefore indicate that a preferred model of mindfulness as conceptualised by the FFMQ with a sample of moderate to severe, persistent depression consists not of five factors but of four: all FFMQ factors except Nonjudge.

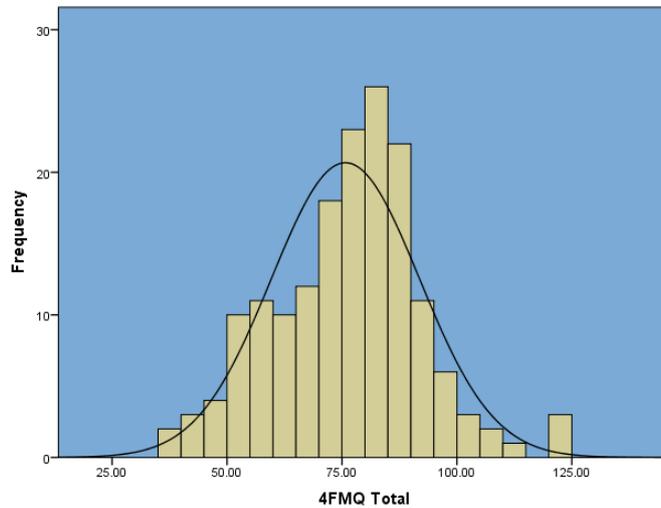
4.1.8 Post CFA investigation of the FFMQ: the 4FMQ

Following analyses suggesting the appropriateness of a four factor model of mindfulness (4FMQ) for a sample with moderately-severe, persistent depression, analyses were conducted to investigate its internal consistency. Before this, the normality of distribution was assessed.

4FMQ: Distribution curve

4FMQ scores were normally distributed as assessed by histograms, normality scores (Shapiro-Wilk), boxplots and levels of skewness (0.04) and kurtosis (0.29), as can be seen from the histogram in figure 9 below.

Figure 9. Distribution curve of the 4FMQ Total score



4FMQ: Internal consistency and split half reliability

The Cronbach's alpha coefficient indicates a good level of internal consistency for the 4FMQ Total score at 0.89. Split half reliability ranged between 0.79-0.80 for both parts of the 4FMQ Total demonstrating acceptable reliability (Kline, 2000), and a Guttman split half coefficient of 0.87. A Spearman Brown coefficient of 0.87 further supports the reliability of this adapted form of the FFMQ.

4.1.7 Comparison of FFMQ scoring between samples

Significant difference in scoring between samples

An independent samples t-test was conducted to determine whether a significant difference of scoring on the FFMQ existed between the depressed and non-depressed samples. A significant difference was found ($p < 0.001$) confirming this primary hypothesis.

4.1.8. Criterion related validity: preliminary analyses of RRS, SCS & AAQ

The relationships between FFMQ and other constructs (Rumination, Experiential Avoidance, and Self-Compassion) were explored as part of validity testing of the FFMQ with the depressed sample. Prior to this preliminary analyses and reliability testing were carried out for each measure with the depressed sample and are reported below.

Rumination (RRS)

Scores for the RRS total appear normally distributed with acceptable levels of skewness (0.04) and kurtosis (0.15). 173 of 187 cases of the 22 item self-report questionnaire were analysed. Five cases with missing items were addressed using Pro Rata method. 7.5% were excluded due to an excessive number of missing items. The mean score for the RRS was 62.33 (SD 11.80), matching the median of 62. RRS subscale means were Brooding: 14.50 (SD 3.43) and Reflection 11.31 (SD 3.70).

RRS: Internal consistency reliability

A Cronbach's alpha score of 0.90 was found indicating excellent internal consistency for the RRS with this sample. Split half reliability testing also indicates strong support for the reliability of the RRS. Both parts of the measure when divided have Cronbach's alpha scores above 0.80, with both a Spearman Brown coefficient and Guttman split half coefficient of 0.89.

Self-Compassion (SCS)

The distribution curve of the SCS is slightly negatively skewed, reflecting a pattern of predominantly low scoring for this measure, and the prevalence of low levels of self-compassion in this sample. However, scores of skewness (0.33) and kurtosis (-0.07) do not suggest extreme forms of this.

173 of 187 cases of this 26 item self-report questionnaire were analysed. Two cases with missing items were addressed using Pro Rata method. 7.5% were excluded due to an excessive number of missing items. Total scale scores are reported as mean scores as is usual with this measure (Neff, 2003a). The mean score for the SCS was 1.98 (SD 0.54), close to the median of 1.96.

SCS: Internal consistency reliability

A Cronbach's alpha score of 0.87 indicates good internal consistency for the measure with this sample. Split half reliability testing also indicates

strong support for the reliability of the SCS. Both parts of the measure when divided have Cronbach's alpha scores above 0.70, with both a Spearman Brown coefficient and Guttman split half coefficient of 0.88.

Experiential Avoidance (AAQ)

Data appears normally distributed including skewness (0.18) and kurtosis (-0.31). 139 cases of the 16 item self-report questionnaire were analysed. The first 22 cases did not complete baseline AAQ due to the measure being introduced into the study some weeks after its commencement. An additional 26 cases were excluded due to an excessive number of missing items. 19 cases with missing items were addressed via Pro Rata method. Statistical analysis of the AAQ was therefore based on 74.3%.of the total sample. The mean score for the measure was 82.43 (SD 10.37), matching the median score of 82.

AAQ: Internal consistency reliability

A Cronbach's alpha score of 0.64 falls below the suggested level of acceptable internal consistency (Kline, 2000) for the measure with this sample. This compares to a score of 0.54 obtained for the nine item version of the AAQ, a factor leading to the use of the 16 item version in the statistical analyses. Different configurations of items including the 22 items used yielded slightly improved Cronbach's alpha scores. However, these versions have not been used in previous validation studies or designed to be used in different configurations and were therefore discarded in the analysis. Split half reliability testing indicates some

support for the reliability of the AAQ. The two parts of the measure when divided have Cronbach's alpha scores of 0.44 and 0.51, with both a Spearman Brown coefficient and Guttman split half coefficient of 0.63.

4.1.9 Criterion related validity: FFMQ and other variables – convergent and discriminant correlations

A primary hypothesis of the study was that all facets of the FFMQ, except Observe, would correlate negatively with depression as measured by the HAMD and the BDI. It was further hypothesised that the strongest correlation would be with the facet Nonjudge. Results are shown in table 19 below.

Table 19. Correlations between FFMQ and depression

Variable	Observe	Describe	Nonjudge	Nonreact	Actaware	FFMQ Total
Depression (HAMD)	-0.10	-0.27**	0.03 _P	-0.20**	-0.30**	-0.29**
Depression (BDI)	-0.19*	-0.30**	-0.05 _P	-0.29**	-0.39**	-0.39**

* $p < 0.05$ (2 tailed)

** $p < 0.01$ (2 tailed)

_P = predicted strongest subscale correlation. **Bold** = actual strongest subscale correlation

Correlations: FFMQ & depression as measured by the HAMD & BDI

As hypothesised, there was an overall statistically significant inverse relationship between depression and the FFMQ, except for the facet Observe as anticipated. Contrary to expectations however, there was no statistically significant correlation between depression and Nonjudge, despite the prediction that this would show the strongest relationship. The facet Nonjudge therefore does not correlate as expected with moderate to severe levels of persistent depression.

Further statistical testing was carried out in order to see if correlations between the FFMQ facets and the HAMD/BDI were significantly different from one another (using Fisher's z). Overall results demonstrate that many correlations were not significantly different from one another, with exceptions primarily involving the facet Nonjudge. All correlations between Nonjudge and depression as measured by the HAMD were significantly different from other facet correlations, whilst the correlation between Nonjudge and the BDI was significantly different from correlations between the BDI and the facets Describe and Actaware (see appendix 16 for full details of significance testing between correlations).

Correlations between the FFMQ and related constructs as identified in secondary hypotheses are reported in Table 20. The majority of these were in the expected directions and statistically significant.

Table 20. Correlations between FFMQ and other variables

Variable	Observe	Describe	Nonjudge	Nonreact	Actaware	FFMQ Total
Experiential Avoidance (AAQ)	-0.15	-0.22**	-0.27** _‡	-0.36**	-0.39**	-0.45**
Rumination Total (RRS)	0.09	-0.11	-0.27** _‡	-0.14	-0.46**	-0.31**
Brooding subscale	-0.01	-0.15	-0.26** _‡	-0.25**	-0.48**	-0.39**
Reflection subscale	0.21**	-0.10	-0.19*_‡	0.04	-0.15*	-0.01
Self-Compassion (SCS)	0.25**	0.26**	0.24**	0.51**_‡	0.45**	0.53**

* $p < 0.05$ (2 tailed)

** $p < 0.01$ (2 tailed)

‡ = predicted strongest subscale correlation. **Bold** = actual strongest subscale correlation

Correlations: FFMQ & SCS

As can be seen from the table above, the correlations between the FFMQ and Self-Compassion were fully consistent with expectations; it demonstrates positive correlations with all facets of the FFMQ and Nonreact has the strongest relationship with self-compassion.

Correlations: FFMQ & AAQ

Experiential Avoidance also demonstrated correlations in line with predictions, except that Nonjudge, rather than Actaware was anticipated to have the strongest relationship with this. Other variables, whilst in the expected directions, did not fulfil predictions to the same degree as highlighted below.

Correlations: FFMQ & RRS

Unexpected findings include those involving Rumination which was predicted to show a nonsignificant relationship with Observe only, but also did not correlate significantly with the facets Describe and Nonreact. The pattern of correlations for individual RRS subscales highlights that Brooding, as predicted, demonstrates predominantly negative and significant correlations with FFMQ facets, whilst Reflection, as predicted, shows weaker correlations with FFMQ facets. Reflection also has a nonsignificant correlation with Describe and Nonreact, contrary to expectations, whilst also unexpectedly demonstrating a significant correlation with Observe.

Correlations: Nonjudge & related constructs

Nonjudge was hypothesised to show the strongest relationship with Depression, Rumination and Experiential Avoidance. In all cases however, it was found that Actaware demonstrated the strongest correlation and that Nonjudge shows only a weak (but significant) relationship with Rumination and Experiential Avoidance and no

statistically significant relationship with depression as measured by both the HAMD and the BDI.

In addition to identifying FFMQ correlations as highlighted in tables 19 & 20 above, relationships between the other variables included in the statistical analyses are identified below.

Table 21. Correlations between Rumination, Self-Compassion, Experiential Avoidance & Depression

	Depression (HAMD)	Depression (BDI)	Experiential Avoidance (AAQ)	Rumination (RRS)	Brooding	Reflection	Self-Compassion (SCS)
Depression (HAMD)		0.38**	0.20*	0.21**	0.16*	0.09	-0.11
Depression (BDI)			0.41**	0.36**	0.43**	0.19*	-0.37**
Experiential Avoidance (AAQ)				0.41**	0.37**	0.14	-0.52**
Rumination Total (RRS)							-0.36**
Brooding						0.43**	-0.45**
Reflection							-0.06

* $p < 0.05$ (2 tailed)
 ** $p < 0.01$ (2 tailed)

As shown above nearly all of the constructs demonstrated statistically significant relationships with each other, with the exception of depression (as measured by the HAMD) and Self-Compassion. Implications of these findings will be discussed in the following chapter.

4.1.10 Results: Summary

Consistent with primary hypotheses, evaluation of the psychometric properties of the FFMQ indicate that it possesses adequate internal consistency across both samples and acceptable support for test-retest reliability (at six months) in the depressed group. The samples demonstrate a statistically significant difference in FFMQ scores indicating that the experience of mindfulness is contingent on the presence or absence of depression.

Findings from CFA suggest that mindfulness is best conceptualised as a four, not five facet construct – that Nonjudge does not constitute an aspect of mindfulness for people with moderate-severe persistent depression. Whilst correlations between the FFMQ subscales and other measures appear to support the criterion-related validity of the FFMQ, these also highlight the unexpected role of Nonjudge in the experience of depression.

4.2 Exploration of the role of mindfulness in moderate-severe depression: Qualitative findings

4.2.1 Introduction

This section reports findings from the qualitative phase of the study focusing on the experience of mindfulness in treatment seeking adults in secondary care mental health services in Nottinghamshire

4.2.3 Interviewee characteristics

The 20 participants were drawn from the CLAHRC and had experienced depression of at least six months duration that was at least of moderate severity as measured by the Hamilton Rating Scale for Depression (HAMD; Hamilton, 1980). CLAHRC RCT Baseline HAMD scores are represented in table 21 and the mean HAMD score was 21.9. In response to questions about the onset and history of depressive disorder, some participants described a course of depression marked by numerous episodes and only rarely experiencing a full remission of symptoms between these. Many described that their depression had been constant since first onset and had been unable to continue working due to depression. Although the diagnosis of treatment resistant depression was not applied to participants entering this study, they experience features consistent with this presentation as discussed in chapter two. Treatment resistant depression has been classified as a current major depressive disorder lasting a minimum of 2 years which fails to respond to at least two courses of antidepressant medication

(Berlim and Turecki, 2007). The participants in this study meet criteria for this type of depressive disorder which is considered to be more burdensome than other forms of depression and is associated with high levels of physical and psychiatric co-morbidity (Greden, 2001). It may also prove particularly difficult to effectively treat in the long term (McPherson et al., 2005).

Of the 20 participants 13 were male and the mean age was 50.6, ranging from 30 to 66 years old. Three participants were described as cohabiting with a partner, three were divorced, three were single and 10 were married. Participants were, or had been employed in a range of jobs including the public sector, ex-military and the service industries. Date of initial depression diagnosis ranged from 1970-2009 with most experiencing a depressive disorder that had been in existence for more than 20 years (See table 21 for details).

Further details of participant characteristics can be seen in table 21 below.

Table 21. Qualitative participant characteristics

Participant ID (pseudonym)	Age	Relationship status	Employment	First diagnosed with depression	HAMD score at baseline
Julie	62	Living with a partner	Social Worker	1990	24
Deidre	65	Divorced	Midwife	2000	16
Susan	57	Married	Housewife	1970	16
Ben	52	Married	Craftsman	1981	25
Fred	66	Married	British Gas	1999	27
Joshua	42	Single	Computer programmer	1988	25
Ruth	30	Single	Unknown	2002	24
Alice	43	Divorced	Police officer	1996	22
Gerald	38	Single	Call centre operator	1994	25
Mark	36	Married	Trainer	1996	22
Sarah	58	Married	Housewife	1971	21
Laurence	53	Cohabiting	Civil servant	1992	19
Frank	41	Married	Ex-soldier	1993	40
Roger	59	Married	Ex-teacher	2000	22
Emma	39	Single	Landscape gardener	1990	17
Anthony	56	Cohabiting	Teacher	1999	16
Simon	57	Married	Accounts clerk	1970	16
James	51	Divorced	Ex-publican	2009	25

Albert	50	Married	Boots manufacturer	2007	16
Henry	57	Married	Unemployed	1973	20

Themes and subthemes are reported in the following section.

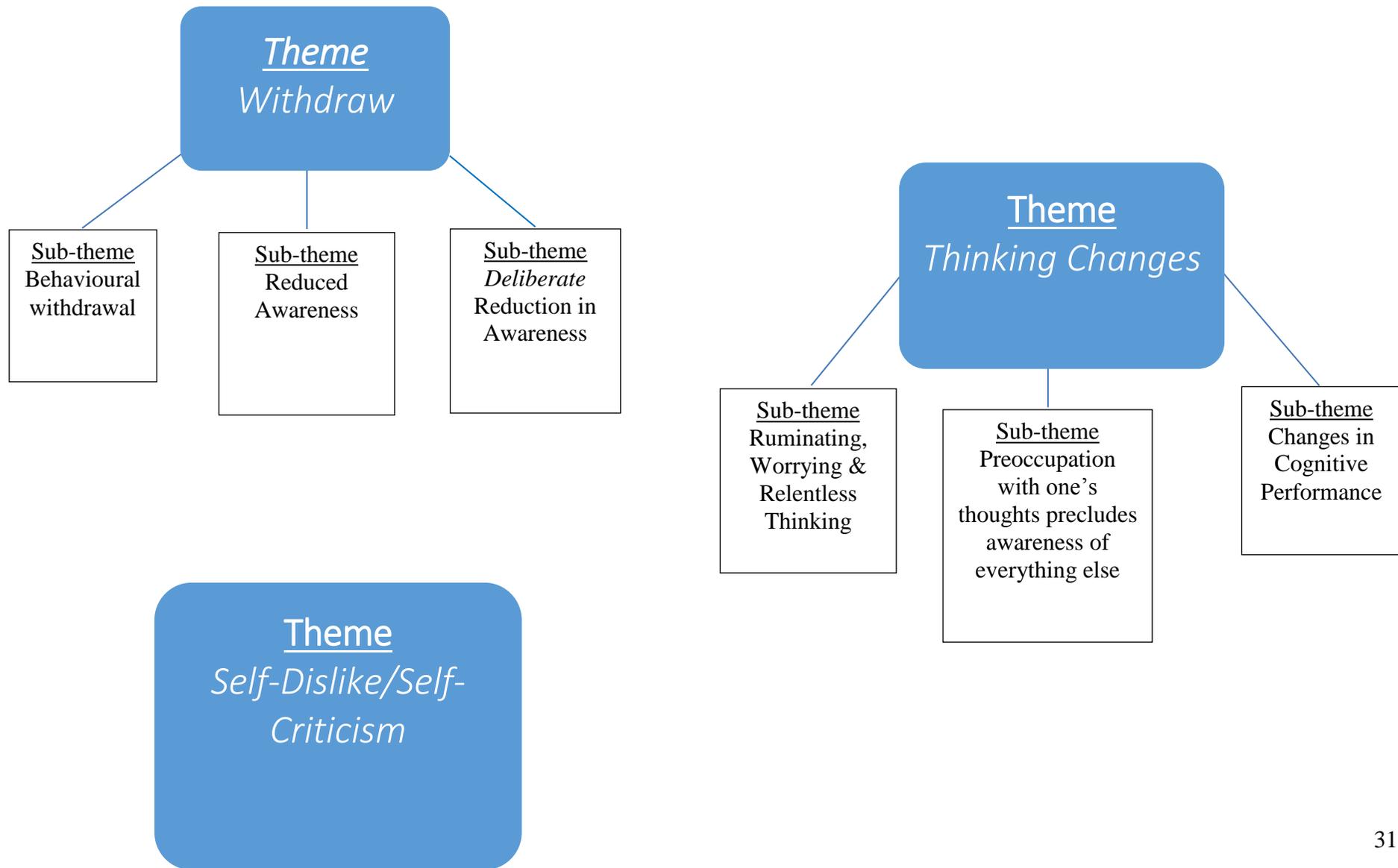
4.2.4 Themes and Sub-themes

Participants' accounts of depression and mindfulness revealed three overarching deductive themes: 'Withdraw', 'Thinking Changes' and 'Self-Dislike/Self-Criticism'.

The themes 'Withdraw' and 'Thinking Changes' are each composed of three sub-themes whilst 'Self-Dislike/Self-Criticism' emerged as a single theme.

Themes and sub-themes are identified in the Figure 10 below.

Figure 10. Map of Themes



A table including summary information about themes and sub-themes is included below.

Table 22. Themes and sub-themes: A summary

Themes & Sub-Themes	Example quote	Number of participants	Deductive/ Inductive
Withdraw			
<i>Behavioural withdrawal</i>	<i>"You shut yourself away"</i> (Gerald)	15	Deductive
<i>Reduced awareness</i>	<i>"stuff happens that I don't see or hear, or that I'm aware of"</i> (Laurence)	18	Deductive
<i>Deliberate reduction in awareness</i>	<i>"You're not aware of anything. You don't want to be aware of anything. You just shut the doors, pull the curtains and that's it"</i> (Ben)	11	Inductive
Thinking changes			
<i>Ruminating, worrying & relentless thinking</i>	<i>"It's overwhelming, the mind races"</i> (Fred)	13	Deductive
<i>Preoccupation with one's thoughts precludes awareness of everything else</i>	<i>"I'm too absorbed with what's going on inside my head rather than what's going on in the room"</i> (Mark)	10	Deductive
<i>Changes in cognitive performance</i>	<i>"It made me, like gone completely stupid I felt like. Like my brain wasn't connected"</i> (Ruth)	18	Deductive
Self-dislike/self-criticism	<i>"I'm useless"</i> (Joshua)	15	Deductive

4.2.4.1 Main Theme: Withdraw

The overarching theme 'Withdraw' consists of three sub-themes which relate to participants accounts of disengaging from life socially and behaviourally in response to the onset of a depressive episode. The sub-themes comprising the overarching theme of 'Withdraw' are:

- Behavioural Withdrawal
- Reduced Awareness
- Deliberate Reduction in Awareness

'Behavioural Withdrawal' and 'Reduced Awareness' were developed deductively whilst 'Deliberate Reduction in Awareness' was derived inductively.

4.2.4.2 Sub-theme: Behavioural Withdrawal

When asked about changes occurring with the onset of depression many participants' noted that such periods are characterised by a tendency to:

"Just withdraw from everything" (Frank, aged 53).

Participants highlight their tendency to reduce contact with people and external environments when mood is depressed. Participants' describe

the urge to isolate themselves from other people and to physically withdraw into their own home/immediate environment.

Participants' comments about withdrawal are in response to questions focusing on how they spend their time when depressed compared to when mood is improved. In addition to descriptions of general withdrawing as provided above, participants also reported specifically avoiding social encounters when depressed, as described by Ruth in response to the question *"Could you tell me about the experience of depression, what it consists of, the actual experience of it, as if you were describing it to a friend..."*

Ruth: *".....I wasn't seeing anyone. I'd lock myself away from everyone I knew. I stopped seeing all my friends and family....."*

(Ruth, aged 30)

National Institute for Health and Clinical Excellence guidelines (NICE, 2004) include social withdrawal as a primary indicator of depression and as such it is recognised as a likely accompanying feature. It is therefore unsurprising that this deductive theme emerged as a key aspect of participants' depressive experience. However, participants additionally provide some insight into why this occurs. For example, Deidre, when describing her tendency to retreat socially goes on to explain her motivation for this:

“For my own protection, as I said to you, I then withdraw from everybody really” (Deidre, aged 65)

This extract therefore highlights how some participants utilise social withdrawal as a deliberate and self-protective strategy.

Increased sleep is recognised as a symptom of depression in NICE guidelines and in the DSM-IV diagnostic criteria (American Psychiatric Association, 1994). In this study it was described as a specific form of withdrawing in order to avoid contact with unwanted phenomena including negative thoughts and feelings. This strategic use of sleep in response to depression is further elucidated by James, a 51 year old ex-publican, in the following extract:

“Sleep. I switch myself off completely. Then I’ll wake up and see if I’m feeling better and if I’m not I’ll go back to sleep. So I can pretty much go to sleep in defence of myself when I need to. Instead of going and shouting and screaming and balling, I pull the duvet over my head and go to bed” (James, aged 51)

While the sub-theme ‘Behavioural Withdrawal’ captures participants deliberate removal of themselves from contact with other people and environments, the next sub-theme describes how participants also withdraw mentally and perceptually.

4.2.4.3 Sub-theme: Reduced Awareness

Participant extracts describe how awareness reduces in tandem with deteriorating mood. This point is succinctly conveyed by the following observation:

“It’s as if things are switched off in your head, some of your sensory perceptions, your attention. Attention in terms of, paying attention to it but some of the attention tools are switched off” (Laurence, aged 53)

Participants report a failure to observe events such as thoughts, feelings, actions, bodily sensations, sights, tastes and interpersonal interactions. This point is captured in the following extract:

“So I don’t know.....what I want to do or what I feel or what I think a lot of the time” (Deidre, aged 65).

Extracts reflect that a reduction in awareness does not just affect distressing aspects of experience but can generalise far beyond these. The following exchange illustrates this point:

TS: *“What aspects of your experience get switched down?”*

PT: *“Bad things. But actually not just bad things. Things you’re watching on the telly. Well everything gets switched off. Like emotions, feelings, sounds”* (Ben, aged 52).

Changes in self-care, typically involving reduced attention to dietary intake, personal hygiene and appearance are another recognised feature of depression (NICE, 2009) Participants described how reduced awareness manifested itself in reduced self-care. For example, participants described missing meals, not shaving and neglecting housework due to a failure to notice the need to undertake these tasks. Ruth describes this vividly in the following quote:

“My flat was a disgusting hovel, I just didn’t notice any of it, I didn’t clean or even see it, I didn’t care about any of that. It was the last thing on my mind. If you looked ok or your surroundings were clean, that didn’t matter. You didn’t notice whether it was raining, windy, sun, day, night whatever. I mean there could be a nuclear bomb dropped outside your window and you wouldn’t notice, you know” (Ruth, aged 30).

As captured in the above quote, reduced awareness extends beyond participants’ experience such as thoughts, feelings and behaviour, but also includes a reduced awareness of the external environment when mood was low. Some participants spoke of a deliberate intention to increase attention to this, in order to counteract depression. This suggests that participants recognise the potential value of expanding awareness when mood is low. Susan speaks of her attempts to do so in the following quote:

“I’ve been spending a lot more time in the garden recently and I’ve been making the point of trying to look up at the sky to notice the clouds and weather, as I always go along looking at the ground, so I’m trying to train myself to look around me a bit more. Normally its look at the television, look down, so I’m trying to be a bit more aware and for all that to be a bit bigger because my world does become very small otherwise” (Susan, aged 57).

Despite speaking of the pronounced tendency for awareness to constrict during episodes of depression, James (aged 57) was able to notice the positive impact of increases in this when discussing a recent incident of hearing a bird singing:

TS: *“and what’s the impact of being able to hear these and be more attentive to experience in this way?”*

PT: *“it relaxes me, switches off the anger, pushes back the depression, lifts my mood slightly and makes me feel better”*

This sub-theme includes extracts relating to the reduction in awareness that accompanies depression. This supports quantitative findings (e.g., Bohlmeijer et al., 2011) showing a negative relationship between mindfulness and depression. Participants’ described decreased awareness as a significant and distressing aspect of their depressive experience and extracts highlight the potential role of this in maintaining

depression through reducing opportunities to fully engage with pleasurable or rewarding experiences. Ruth describes how this feature changes as her mood improves:

“Well, now my mood is good I notice everything. I thought it was a bit corny because I notice stupid things like the colour of the sky which I never did before. Because I got a job as a bailiff at a fishing site, collecting money from the fishermen at a lake. So um... that’s when I started, my mood started picking up and I noticed, all the things, like the fish, the lake and the sky, because you’re there at sun up and sun down so you’re seeing all the different things like that. And I thought to myself how nice the sky is, and I remember thinking that recently I wouldn’t have noticed anything like that, whether it was sunny or anything. So now my mood is good I notice that kind of thing”

This sub-theme captures participants’ observations of awareness decreasing in association with depressed mood. In addition to the seemingly automatic tendency for this to happen, analysis of participant interviews unexpectedly highlighted that this state is deliberately sought by some as depression deepens. This finding is discussed in the following sub-theme ‘Deliberate Reduction in Awareness’

4.2.4.4 Sub-theme: Deliberate Reduction in Awareness

This unexpected sub-theme emerged inductively from the data and involves a deliberate constricting of awareness following onset of depression as described succinctly by Ben:

“If you’re blanking everything out, you haven’t got to feel anything. You’re wanting to keep yourself down there, down deep in your head. You want to blank out things you’ve actually done. Something’s in there that wants to switch off” (Ben, aged 52).

A conscious switching off of awareness was echoed by participants including Joshua (aged 42) in the following comment:

“Because I feel overwhelmed by all these things so I have to withdraw in, and therefore that sense of perhaps like a daydream state that I go to, a trancelike state that I take myself into. Like a blank, a nothing. It’s part of that drawing in and not being able to focus” (Joshua, aged 42).

Intentionally inhabiting a state where awareness of experience is profoundly restricted is therefore described by some as a tactic for dealing with overwhelming states of stress and anxiety when mood is low. However, whilst reduced awareness is deliberately instigated in an effort to avoid contact with distressing phenomena, it may further reduce opportunities to engage in pleasurable and rewarding encounters. This is captured by James’s description of hearing a bird singing below:

“Blackbird singing is a lovely sound, but when my mood is bad on the other hand, I wouldn’t hear a sound out there because I would be closing myself down. Shutting myself off in my little box” (James, aged 51).

Several activities associated with depressed mood may be regarded as behavioural strategies to escape from negative feelings and situations, such as absorption in distracting activities, or retreating into sleep. Others may represent efforts to directly achieve an improved emotional state, such as using alcohol or recreational drugs. However, when considered through the perspective of mindfulness, these actions may be viewed as not just a way of achieving an altered state, but more specifically as deliberate strategies to shut down awareness. For example, Simon, observed his habit of doing Sudoku puzzles in order to exclude awareness of unwanted aspects of experience:

“I can also find easy to moderate ones more difficult but it can also keep my mind off the low mood, and becomes a distraction. That way, if difficulties do come up, I don’t notice them so much” (Simon, aged 57).

Intentionally dulling awareness of upsetting feelings through drug use or switching awareness off altogether through sleep are tactics identified by Ruth in the following extracts:

“I’d self-medicate as soon as I’d get in the house. I’d be smoking a lot of weed or valium or whatever was in house. I tried as much as possible not to feel anything, that’s why I was doing all of that” (Ruth, aged 30).

She goes on to describe escaping from negative thoughts by accessing a state of unconsciousness:

“A lot of the time, an avoidance is to go to sleep so that nothing is thought of then”

Whilst previous quantitative studies (e.g., Bohlmeijer et al., 2011) have identified changes in mindful awareness as a feature of depression, none have explored whether this is consciously activated by participants. This sub-theme suggests that rather than a passive reaction to depressed mood, reductions in awareness are instead initiated by participants in an effort to manage the distress accompanying this problem. Analysis of participant interviews therefore suggests that participants are able to exert some degree of control over levels of awareness, restricting this as a deliberate mechanism to avoid contact with emotional pain and unwanted phenomena associated with depressed mood.

4.2.4.5 Main Theme: Thinking changes

The overarching theme of ‘Thinking Changes’ is comprised of three deductive sub-themes and relates to participants descriptions of alterations in mental activity following the onset of depression. An

increased rate and type of thinking is typically described that can minimise attention to other areas of experience. Associated changes in intellectual functioning were also described as a component of this theme.

The three sub-themes comprising the overarching theme of 'Thinking Changes' are:

- 'Ruminating, Worrying & Relentless Thinking'
- 'Preoccupation With One's Thoughts Precludes Awareness of Everything Else'
- 'Changes in Cognitive Performance'

4.2.4.6 Sub-theme: Ruminating, Worrying and Relentless Thinking

A tendency to ruminate and worry excessively was frequently reported, with many participants vividly describing thinking becoming increasingly problem focused, repetitious and upsetting as mood deteriorates. This point is succinctly expressed in a statement made by James when discussing his experience of depression:

"The idiot in my brain, also known as the gap between my ears doesn't know better, would like to understand why the hell this is happening. I'm always trying to analyse and analyse and understand and oh my God! It's going round and round and round and round. It drives you nuts! And the more I try to analyse it the further down I drive myself..... and

the louder the voice gets “ah you complete useless piece of shit. You’re a complete waste of air. Waste of time. Go away and die!” (James, aged 51)

This extract powerfully captures the process of ruminating and its consequences for this participant and is an experience shared by many others in this study. Depressive rumination is identified as a factor potentially triggering and maintaining depression (Nolen-Hoeksema, 2000, Segal et al., 2002), and within this study it is a key change in thinking reported by participants. As in the above quote it can begin as an intention to intellectually make sense of depression but quickly deteriorates into negative and self-critical thinking.

In addition to ruminating, an increase in worrying was also described by participants as a feature of depressed mood. Excessive worrying is recognised as a contributing factor to a sense of demoralisation (Dugas & Robichaud, 2007) and is a common feature of depression. Frank, an ex-soldier with a 21 year history of depression, talks of his tendency to worry for protracted periods of time when depressed:

“In the past I could spend weeks worrying about something when I was bad.....” (Frank, aged 41).

These comments highlight the negative, repetitiousness and relentless nature of thinking that can accompany an episode of depression.

In addition to the change in the *type* of thinking experienced by participants, extracts also indicate that the *rate* of thinking is at times significantly increased. Participants' frequently described their thoughts as becoming more rapid as noted by Ruth in the following comment:

"My mind was constantly racing" (Ruth, aged 30).

Henry also noted that this type of thinking could happen to the exclusion of other important activities:

"In the depressed state I'm extremely passive and won't do anything like eat, or get up, or listen to the radio I just think about stuff" (Henry, aged 57).

Participants' recognised the role of changes in thinking in aggravating depression as, highlighted in the comment below made by Joshua:

"I said to my psychiatrist that the problem is the thoughts I'm having and that they're overwhelming and they're pushing me into more and more depression" (Joshua, aged 42).

This sub-theme contains extracts describing participants' experience of relentless and overwhelming mental activity including rumination and worry that appears difficult to control. It is identified as a prominent and

unwanted feature of depressive experience and its role in fuelling low mood is noted by many participants. Participants nevertheless appear compelled to engage in this activity often to the exclusion of everything else. The role of this type of thinking in limiting awareness of other aspects of experience is captured in the next sub-theme 'Preoccupation with one's thoughts precludes awareness of everything else'.

4.2.4.7 Sub-theme: Preoccupation with one's thoughts precludes awareness of everything else

This sub-theme identifies how awareness is impeded by relentless thinking, including rumination and worry. Extracts capture how attention to phenomena beyond this, including sensory experiences and events in the environment is profoundly restricted by this activity. For example, when asked about how she spent her time when last experiencing an episode of depression, Ruth gave the following answer:

".....Nothing could distract me from just being sad. Constantly thinking about thoughts of everything being horrible. Even if you put the telly on, I just wouldn't watch it, yeah I couldn't tell you what had been on. It was just thoughts all the time" (Ruth, aged 30).

Mark describes how preoccupation with thinking can impair his performance in his job, due to an inability to attend to phenomena outside of thinking:

“That’s not very conducive to me being a responsive or entertaining presenter, because I’m too absorbed with what’s going on inside my head rather than what’s going on in the room. It’s almost like I’ve put the shutters down or something” (Mark, aged 36).

Fred expresses his view that the automatic tendency to prioritise thinking above other activities is prompted by an attempt to problem solve, and this is recognised as a deliberate function of rumination (Segal et al., 2002). However, the unintended consequence arising from this is that contact with other potentially helpful and enjoyable aspects of experience is restricted, as captured in the description below:

“I’ve looked at television as though I’m using avoidance but after half an hour I realise I haven’t seen a thing. Now I think, “What’s happened here?” and I’ve got no idea. The only conclusion I can come to is that my brain has again tried to solve whatever problem it’s working on at that time, rather than watching TV so I’ve missed it” (Fred, aged 66).

The following sub-theme identifies a further change in mental activity that was reported by participants as a significant feature of their depressive experience: ‘Changes in Cognitive Performance’.

4.2.4.8 Sub-theme: Changes in Cognitive Performance

This sub-theme refers to a reduced ability to think clearly and coherently associated with problems with concentration and memory. Participants

describe difficulties organising thoughts in a structured and coherent manner since the onset of depression. James summarises this in the extract below:

“My brain won’t work properly” (James, aged 51).

Information about this aspect of depression was elicited by asking participants about changes in intellectual functioning, but information relating to this was also forthcoming simply from asking participants about key experiences associated with depression. Albert, who has been experiencing depression intermittently since 2007 clarifies that this change in functioning is specifically related to the onset of depression:

“Before my depression I could think more clearly than I can now. There wasn’t a problem” (Albert, aged 50).

Memory problems form a significant part of this problem and were widely reported by participants. Lapses in memory can affect many areas of life and potentially has serious and even dangerous consequences as noted by Sarah:

“I’ve not got a very good memory now. Like sometimes I’ll go to the cooker and forget that it’s hot and try to take something out without gloves on. I’ve burnt myself a few times like that. I forget things that are in the cooker and that type of thing. Once I went to the cooker and I

couldn't remember how to turn it on and that..... Mad! I went to hospital on the wrong day once, I get confused" (Sarah, aged 58).

The subsequent negative impact on the ability to function socially is observed by a number of participants, including Gerald:

"Normally when you have a conversation with somebody it's like a game of tennis isn't it? You bat it back and forth between each other and so on, but I feel when I'm depressed that I just can't get the ball back over the net... exactly if you're like playing tennis with someone you want it to be with someone of a similar standard or its just boring isn't it? And that's how it feels, like I just can't get the ball back over the net and you just know that in another situation you'd just come up with an ordinary reply or whatever, but you just can't even manage that" (Gerald, aged 38).

Alongside changes in memory and concentration, cognitive retardation is recognised as a common feature of depression (Caliguirri & Elwanger, 2000) and this was subsequently identified during analysis of participant transcripts. This change was characterised by participants' descriptions of intellectual functioning being affected by a loss of fluency as captured by Susan:

"Speech is a bit slower and thoughts are much slower" (Susan, aged 50).

This sub-theme emerged from participants' quotes that relate a deterioration in cognitive performance following the onset of depression. This is characterised by reduced memory and concentration and a slowing down of mental processes that affects many aspects of daily life. These changes were also reported to contribute to an increasingly negative self-perception as participants may view themselves in self-critical terms as a result of changes in cognitive ability, as captured in the quote below:

"I'm a clever person but unfortunately due to depression I'm a thick bastard" (James, aged 51).

This increased level of self-dislike and criticism accompanying depression is captured in the next theme.

4.2.4.9 Main Theme: Self-dislike/Self-criticism

This theme contains extracts relating participants' accounts of self-criticism and self-dislike within the context of depressed mood. Sarah's comment below succinctly conveys her total sense of failure and inadequacy and the total conviction with which she holds this opinion:

"I feel a complete failure in everything and every way. Because I am"
(Sarah, aged 58).

The theme 'Self-dislike/Self-criticism' contains many similar comments and participants frequently report intense feelings of self-loathing and worthlessness. The profound depth of such negative feelings is powerfully expressed through Julie's quote below:

"I remember one of the recurrent thoughts that still stays with me is that I'm so low I'm crawling on the ground and if I could be lower than a snake on the ground I would be" (Julie, aged 66).

The existence of depression and its subsequent impact on functioning in day to day living can additionally exacerbate self-dislike and self-criticism through the perception that this is further evidence of inadequacy and weakness. This is highlighted during a discussion about the impact of depression with Joshua:

"Low self-worth and feeling useless because of all of this, and this is further evidence that I am not very... well that I'm useless" (Joshua, aged 42).

That such ideas are particularly prevalent during episodes of depression is clarified in an extract from Deidre, who is clearly able to see the link between her mood and her self-opinion:

“I feel as if I’m not worthy of life, but that feeling goes up and down depending on how I’m feeling. When I’m very down that feeling is very prominent” (Deidre, aged 65).

Whilst this comment is not an explicit expression of suicidal thinking, it nevertheless appears closely related. The next comment from this participant appears to indicate a further progression towards suicidal intention, driven by profound feelings of worthlessness:

“You just think about yourself in the worst possible way, that you’re a worthless person and you don’t deserve a place on this earth and its time that you relieved yourself and everyone around you of your presence. And that’s how you feel at that lowest point”

Feelings of worthlessness and suicidal thinking are listed as key symptoms of depression in diagnostic manuals (ICD 10, DSMIV). This is perhaps unsurprising given the potentially relentless and tormenting tone of self-critical thinking as described forcefully by James:

“So its “Fuck you, you’re not worth living” (James, aged 51).

Within this theme feelings of unworthiness and profound self-hatred are vividly expressed by participants and include intimations of suicidality. Participants’ reported sense of inadequacy is partially informed by the

changes in performance associated with depression, which in turn may further aggravate depressed mood.

4.2.4.10 Summary

The qualitative phase of this study provides rich detail about the experience of enduring and disabling depression in people in secondary mental health services. Themes and sub-themes derived from thematic analysis indicate that people who have a protracted experience of moderate-severe depression relate a number of features accompanying this problem, namely; they withdraw, experience changes in thinking and become more self-critical. Whilst many of these features are recognised as constituting diagnostic criteria for depression, when considered through the perspective of mindfulness it is apparent that participants describe a significant reduction of elements of this form of awareness as a key characteristic of their depression. Whilst this may be instigated intentionally as a self-protective strategy, the ensuing state of isolation and 'perceptual nihilism' is likely to increase participants' distress and further compound depression.

Chapter 5

Discussion

5.1 Introduction

This chapter examines the study findings. It begins by restating the purpose of the research undertaken before presenting an overview of results and an explanation of these in relation to relevant prior research and published theoretical insights. The significance, strengths and limitations of the study are identified and implications for future research and mindfulness interventions arising from study findings are examined. Data from both quantitative and qualitative methods are synthesised in order to more fully understand and explain the role of mindfulness in moderate to severe, persistent depression.

5.2 Purpose of the research

This study aimed to investigate the role of mindfulness in the experience of moderate to severe, persistent depression. Two study objectives were identified: 1) psychometric testing of the Five Facets Mindfulness Questionnaire (FFMQ) in order to evaluate its reliability and validity, and 2) qualitative exploration of participants' experience of mindfulness during depressive episodes via semi-structured interviews.

5.3 Overview of findings

5.3.1 Psychometric testing of the FFMQ

187 participants presenting with moderate to severe, persistent depression in secondary care mental health services completed measures of mindfulness, depression, experiential avoidance, rumination and self-compassion. In addition to the depressed sample a non-depressed control group of 33 participants were recruited and completed the FFMQ as a contemporaneous comparison. Preliminary analyses indicate the normal distribution of data as assessed by histograms, normality scores, boxplots and levels of skewness and kurtosis across both samples.

A significant difference was found in scoring between depressed and non-depressed participants. Reliability testing indicates an acceptable level of internal consistency reliability and provides support for test-retest reliability. Whilst fit indices indicate that a five factor model is acceptable, factor analyses suggest that a four factor solution (excluding Nonjudge) is the best fit for the data. In addition to factor analyses, criterion related validity was evaluated by assessing correlational patterns between the FFMQ and related variables captured in validated measures including the Acceptance and Action Questionnaire (AAQ), Ruminative Response Scale (RRS), the Hamilton Rating Scale for Depression (HAM-D), the Beck Depression Inventory (BDI) and the Self-Compassion Scale (SCS). Overall, findings were consistent with predictions except for the facet Nonjudge which did not correlate significantly with depression.

5.3.2 Qualitative exploration of mindfulness in depression

A subset of 20 participants were recruited and underwent semi-structured interviews which were subsequently analysed using thematic analysis (TA). A map of themes was developed identifying a number of changes associated with the onset of depressed mood. These include behavioural withdrawal as a key aspect of depressive experience and decreased awareness of internal and external experiences that appears to occur both automatically and as a deliberate response to deteriorating mood. These experiences are accompanied by changes in thinking characterised by a deterioration in intellectual functioning, and relentless and repetitive thoughts that are difficult to escape from, obstructing awareness of other aspects of experience. The onset of depressed mood is further typified by a profoundly negative self-view.

5.4 Discussion of findings

5.4.1 Internal consistency

Evaluation of internal consistency reliability confirmed Cronbach alphas in excess of 0.70 as predicted in both samples. Prior psychometric studies with clinical samples also report adequate internal consistency reliability with Cronbach alphas ranging from 0.67-0.91 (e.g., Baer et al., 2008; Christopher et al., 2012). Consistent with current study findings these report that either the facet Nonreact or Observe have the lowest Cronbach alpha and that the facet Describe has the highest. Study

findings therefore support the internal consistency reliability of the FFMQ in those with moderate-severe persistent depression.

5.4.2 Test retest reliability

Whilst there was a substantial drop in numbers completing the FFMQ at T2 this exceeds Kline's (2000) recommendation of a minimum of 100 participants (n=167 at T1 and n=106 at T2). A correlation coefficient of 0.63 between T1 and T2, falls below the figure of 0.7 identified by Kline (2000) as the minimum for establishing test-retest reliability, but nevertheless indicates a significantly positive correlation between the measure at both time points. A number of factors may limit the strength of this correlation. For example, the gap between T1 and T2 exceeds recommendations that this delay should not be in excess of three months (Maltby, et al., 2010). Furthermore, participants were all experiencing levels of depression of at least moderate severity at baseline, and were also receiving treatment for this within secondary mental health services during the six months between T1 and T2 leading to a drop in mean scores on depression measures at T2 which may be accompanied by altered levels of mindfulness, represented by an increased mean score for the FFMQ Total from 95.46 at T1 to 98.06 at T2. Therefore the active treatment provided and the substantial amount of time between T1 and T2 may influence the test-retest correlation coefficient as changes in mindfulness may occur during this time as a result of improved mood (e.g., Chiesa et al., 2015), influencing the subsequent correlation between T1 and T2. The strength of the correlation coefficient between

T1 and T2 may therefore be affected by changes in participants rather than low reliability of the FFMQ. Overall, whilst findings do not fully meet predictions identified in chapter two these nevertheless support the test-retest reliability of the FFMQ.

5.4.3 Levels of mindfulness in relation to moderate to severe, persistent depression

The depressed sample utilised in this study appear to be the most depressed group tested so far using the FFMQ, with a mean score of 35 on the BDI and 22.60 on the HAMD with 43% scoring above the threshold of 23 indicating severe depression. This sample's depressive presentation was also characterised by a degree of persistence, having been under the care of secondary mental health services for a minimum of 6 months without remission despite treatment, and with an average duration of depressive disorder of 17 years. Furthermore, 86% of participants reported a current depressive episode of at least one year's duration on entry into the study, and a mean figure of 11.6 years of current episode reported by participants. Therefore, whilst available data is not sufficient to categorically define the sample as such, their presentation is nonetheless characterised by severity, chronicity and treatment resistance.

As predicted, the depressed sample (n=187) and the non-depressed control group (n=33) scored significantly differently on the FFMQ ($p < 0.001$). In addition to the depressed sample having the highest level

of depression found in studies using the FFMQ they also had the lowest recorded score on the FFMQ that the author could find (FFMQ total: 95.82). The closest comparison for scoring on the FFMQ is found in samples with 'problematic levels of stress' (FFMQ total: 108.91. Baer et al., 2012), women with Borderline Personality Disorder (FFMQ total: 110.36. O'Toole et al., 2012), and those with mild to moderate depression (FFMQ total: 113.88. Bohlmeijer et al., 2011). Therefore, to the best of the author's knowledge, the quantitative findings in this study show that the sample with the highest recorded level of depression in studies utilising the FFMQ have the simultaneously lowest level of mindfulness. In comparison, the non-depressed sample had very low scores on both the HAMD (1.18) and the BDI (1.91). Whilst unsurprising insofar as scoring below the threshold for depression was criteria for inclusion in the study, these scores nevertheless represent very low levels of depressive symptomatology, even in specifically non-depressed groups. The closest comparison of depression scoring found in other studies exploring mindfulness exist in a study including a sample described as healthy volunteers prior to undertaking mindfulness training (BDI: 2.45. Parkin et al., 2014). Other FFMQ studies identified as involving a healthy control group report mean BDI scores ranging from 8.28 (Barnes & Lynn, 2010) to 12.97 (Miyata et al., 2015).

Low scores on measures of depression for the non-depressed sample in this study are accompanied by correspondingly high scores on the

FFMQ (148.55) a score that is only exceeded in populations with meditation experience as highlighted in the table below.

Table 23. FFMQ scoring in participants with meditation experience

Authors	Study title	Study sample	FFMQ total
Baer, Smith, Lykins, Button, Krietemeyer, Sauer, Walsh, Duggan & Williams (2008)	Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples	Regular meditators (n=278)	150.02
de Bruin, Topper, Muskens, Bogels & Kamphuis (2012)	Psychometric properties of the five facets mindfulness questionnaire in a meditating and non-meditating sample	Meditators (n=288)	148.94
Lykins & Baer (2009)	Psychological functioning in a sample of long-term meditators	Regular meditators (n=182)	154.2
Current study	Mindfulness in depression: a mixed method study investigating the role of mindfulness in moderate to severe,	Non-depressed sample (n=33)	148.55

	persistent depression		
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Study findings therefore indicate that an inverse relationship between mindfulness and depression exists in those with moderate to severe, persistent depression. Furthermore, very low levels of depressive symptomatology are found to be accompanied by comparatively high levels of mindfulness. Results echo findings from previous studies suggesting that severity of depression is accompanied by diametrically opposing levels of mindfulness and vice versa (e.g., Cash & Whittingham, Bohlmeijer et al., 2011). This finding is consistent with predictions about the FFMQ in relation to depressive symptoms and supports the construct validity of the FFMQ.

Thematic analysis of semi-structured interviews exploring the relationship between mindfulness and depression echo the negative relationship between these found in prior quantitative (e.g., Bohlmeijer et al., 2011; Baer et al., 2006) and qualitative studies (e.g., Allen et al., 2009; York et al., 2007). As described in the previous chapter, the subthemes 'Reduction in awareness', 'Deliberate reduction in awareness' and 'Preoccupation with one's thoughts precludes awareness of everything else' capture participants experience of awareness reducing in the face of deteriorating mood. Though these subthemes are not synonymous with mindfulness due to lacking essential elements including acceptance (Germer, 2009), they nevertheless capture key aspects of mindfulness such as a capacity for

attentiveness to present moment experience (Thera, 1962). Thematic analysis therefore supports quantitative results highlighting an inverse relationship between mindfulness and depression.

A recent synthesis of qualitative explorations of mindfulness-based approaches indicates that changes in all five facets of the FFMQ arise from these (Malpass et al., 2012). Depression related decreases in individual FFMQ facets are also suggested by participant interviews in the current study. For example, an ability to be aware of internal and external experiences is likely to result in an increased facility for articulating these. The facet Describe is therefore included as a constituent of mindfulness within the FFMQ and negative changes in this facet are suggested by participant quotes within the sub-theme 'Changes in Cognitive Performance' which refers to a deterioration in intellectual functioning associated with depression. Fred (aged 66) refers to a difficulty in expressing himself in the following extract:

"I can't..... the words don't come to mind, that you know you'd like to use. It's like to pick one out of the lottery, all those balls going around. If the right one pops up you think you can use that but it does seem to do with chance often. And to put it all together it sometimes doesn't make sense"

However, rather than solely capturing a reduced ability to express experiences, as in the facet Describe, participant extracts predominantly

appear to relate to general changes in short-term memory and impaired concentration, both of which are identified as clinical symptoms of major depressive disorder (World Health Organisation, 1992, American Psychiatric Association, 1994). Losses of concentration, memory and cognitive performance have also been identified as sub-themes in other qualitative studies, consistent with findings in the current study (Rice et al., 2011, Amini et al., 2013). Nevertheless, a decreased ability to find words and reduced fluency of speaking have been noted in another qualitative study of severely depressed participants (Fossati et al., 2003) supporting current study findings that the facet Describe is negatively affected by depressed mood.

Negative changes in other FFMQ facets are suggested by participant descriptions from semi-structured interviews, including the facets Actaware and Observe. The facet Actaware includes items relating to a poor attention span, distractibility and a tendency to operate on 'autopilot'. The following quote is indicative of low levels of this facet during periods of depressed mood:

"Well I don't know what's going on sometimes. I can be watching telly and not know what I'm doing" (Ben, aged 52).

The facet Observe contains items referring to the ability to notice elements of experience such as thoughts, feelings, bodily sensations, smells and sights. As identified in the previous chapter and highlighted in

the comment below, participants clearly relate how these capacities alter depending on mood state:

“Stuff happens that I don’t see or hear, or that I’m aware of” (Laurence, aged 53).

Reductions in the facets Actaware and Observe may be partially explained by increased mental activity, as captured in the subtheme ‘Preoccupation with one’s thoughts precludes awareness of everything else’, echoing findings from a recent qualitative study which observed that preoccupation with negative thoughts inhibited depressed participants’ from attending to other aspects of present moment experience (Amini et al., 2013). Similar disturbances in thinking are identified in studies exploring experiences of depression including increases of worry, rumination and racing thoughts with negative emotional consequences (Amini et al., 2013; Smith & Rhodes, 2015). In addition to rumination an agitated and relentless style of thinking was reported by participants in the current study, appearing similar to the theme in a prior study labelled ‘Frenzied Thinking’ it relates to an intense and negative type of thinking that is involuntary, difficult to control and exacerbates existing depression (Smith & Rhodes, 2015).

A tendency to ruminate is to be expected in this sample given concurrent levels of depression (Nolen-Hoeksema, 1991; Segal et al., 2013), and the subtheme of ‘Ruminating, worrying and relentless thinking’ emerges

in the present study as a significant factor impeding observation and awareness of alternative aspects of experience. It is further described as an undesirable and upsetting aspect of depressive experience that may aggravate depression through inhibiting awareness of positive phenomena, or engagement with alternative, potentially enjoyable behaviours. Rumination in depression is also associated with high levels of self-critical thinking (Teasdale, 1999), which is recognised as a particularly pathogenic characteristic of depressive disorder (Gilbert et al., 2006). Participant comments in the current study convey a profound self-loathing that is a distressing feature of depression for many of those interviewed. This is captured in the theme ‘Self-Dislike/Self-Criticism’, the content of which appears similar to experiences captured in the mindfulness facet Nonjudge, referring to self-criticism for unwanted thoughts and feelings. For example, Susan, aged 57, criticises herself for her inability to experience emotions other than ‘numbness’ following many years of unremitting depression:

“Well life’s a mixture of all sorts of things to be experienced and, um…… responded to and made sense of…… so, not feeling is …… I think has rendered me sub-human”

Theme analysis therefore suggests that low levels of the facet Nonjudge are associated with depressed mood. The facet Nonreact however, does not appear to be captured within a specific theme in the qualitative analysis. However, facet items refer to an ability to be cognitively,

behaviourally and emotionally nonreactive to distressing experiences including negative thoughts and emotions, and participants describe a range of reactions to depressive experience in an effort to reduce the negative impact of this, including withdrawing socially, consuming alcohol and illegal drugs and recourse to relentless and repetitive thinking to the exclusion of other activities. These descriptions are consistent with other studies highlighting withdrawal (e.g., Rice et al., 2011), drug use (e.g., Chuick et al., 2009) and rumination (e.g., Nolen-Hoeksema, 1991) as typical reactions to depressive onset, and appear indicative of processes outlined in Teasdale's Differential Activation hypothesis implicated in depressive relapse (Teasdale & Barnard, 1993). As such, themes, subthemes, and participant quotes within them exemplify a quality of reactivity as conceptualised within the FFMQ facet Nonreact, appearing a relevant feature of participants' experience of moderate to severe, persistent depression.

In summary, synthesis of quantitative and qualitative findings strongly suggest that elements constituting mindfulness as conceptualised by the FFMQ are noticeably reduced in the context of depressed mood. Statistical findings across samples and participant descriptions therefore converge on the existence of an inverse relationship between these two constructs.

5.4.4 Construct validity of mindfulness in moderate to severe, persistent depression as indexed by the FFMQ

5.4.4.1 The facets Observe and Nonjudge in moderate to severe, persistent depression

Prior studies assessing the factor structure of the FFMQ in clinical samples, including those with depressive disorder, have found that all five factor models conform to fit indices to an acceptable level. Where all five factors are included, a correlated model is the best fit for the data (Bohlmeijer et al., 2011; Veehof et al., 2011), suggesting that whilst related, the combination of facets do not necessarily constitute a latent construct of mindfulness. However, when the facet Observe is removed from analyses (Williams et al., 2014; Curtiss et al., 2014), a hierarchical model is favoured, indicating that the remaining facets jointly form a unifying mindfulness construct. CFA conducted in the current study mirrors previous findings; a correlated model is the preferred fit when a five factor model is tested, and the removal of Observe indicates that a hierarchical model is favoured.

The facet Observe is found to demonstrate nonsignificant correlations with one or more facets of the FFMQ in all previous studies utilising samples without meditation experience (Curtiss et al., 2014; Veehoff et al., 2011; Christopher et al., 2012; de Bruin et al., 2012; Tran et al., 2013; Van Dam et al., 2012), including those with mild to moderate (Bohlmeijer et al., 2011) and recurrent depression in remission (Williams et al., 2014). Regarded as a core feature of mindfulness, it was initially

surprising that the facet Observe demonstrated inconsistent relationships with other mindfulness facets and failed to load onto a mindfulness factor (Baer et al., 2006). This facet was subsequently hypothesised to represent a form of self-focused attention (Baer et al., 2008), which has been defined as the awareness of internally generated stimuli such as bodily sensations, emotions and thoughts (Ingram, 1990). Self-focused attention is likely to be maladaptive in those with depressed mood (Mor & Winquist, 2002), and is a common feature of many psychological disorders (Harvey et al., 2004). Containing items relating to awareness of internal phenomena such as bodily sensations, thoughts and feelings, the facet Observes appear to overlap with this construct potentially explaining the association of Observe with negative psychological symptoms (Baer et al., 2008).

Studies have subsequently confirmed the hypothesis that this facet would demonstrate a more consistent relationship with other mindfulness facets when accompanied by meditation experience (e.g., Baer et al., 2008). It is proposed that Observe forms an element of mindfulness in this population because it is performed 'mindfully', i.e., where observation of experience is accompanied by a non-judgmental and nonreactive stance to this, rather than constituting a form of negative self-focused attention, as may be the case in samples without heightened levels of mindfulness (Baer et al., 2008). Contrary to predictions identified in the current study, results indicate that whilst the removal of Observe yields improved model fit according to fit indices, this

facet loads significantly and strongly onto an overarching construct of mindfulness and correlates significantly with all other facets except Actaware. This finding is particularly unexpected given that Observe has loaded onto a mindfulness factor previously only in samples with meditation experience, with correspondingly high mean scores on the FFMQ (e.g., Baer et al., 2008). In contrast, the sample in the current study have the lowest score on the FFMQ in studies to date and consequently the facet Observe would not be expected to correlate closely with other facets or load onto a mindfulness factor. A possible explanation accounting for this finding is offered by theme analysis in the current study which highlights the tendency of participants to be particularly unobservant of experiences, as awareness becomes both automatically and deliberately dulled in the face of significant levels of depression (Subthemes: 'Reduction in Awareness'; 'Deliberate Reduction in Awareness'). The subsequently diminished capacity for observation of experience may offset the tendency of Observe to operate as a form of heightened but maladaptive self-focused attention. Attention to experience may be further typified by a nonreactive, apathetic stance, as participants fail to attend fully to experience due to a lack of motivation, interest and energy characteristic of clinical depression (World Health Organisation, 1992, American Psychiatric Association, 1994). This may be further compounded by absorption in ruminative, repetitive thinking interfering with observation of alternative aspects of experience (Segal et al., 2013), as identified in theme analysis (Subtheme 'Preoccupation with one's thoughts precludes awareness of

everything else'). These depression related changes in the capacity for observation of experience may lead to Observe and other facets operating consistently with each other and explain CFA findings relating to Observe. This explanation is partially undermined by the finding that Observe and Actaware do not correlate significantly. However, despite the lack of a significant correlation between these, there was a tendency for these to be correlated positively.

Examination of CFA results also revealed unexpected findings relating to the facet Nonjudge. Whilst previous studies have shown a non-significant correlation between Nonjudge and other facets (e.g., Bohlmeijer et al., 2011), these have predominantly related to Observe, apparently confirming the contradictory role of this facet in those without meditation experience. However, CFA in the current study identifies that Nonjudge has a nonsignificant correlation with the facets Nonreact and Describe. Furthermore, contrary to study predictions, Nonjudge does not load significantly onto a mindfulness factor – the first such finding in a study examining the factor structure of the FFMQ to date. Fit indices confirm that removal of the facet Nonjudge yields slight improvement in model fit compared to a five factor model. Results from CFA therefore suggest that a four factor model of mindfulness (excluding Nonjudge) as measured by the FFMQ, may be preferred in a population of moderate to severe, persistent depression.

Several studies investigating the psychometric properties of the FFMQ have examined the relationship between this and related constructs in order to clarify support for its construct validity. Measures assessing a range of variables including psychological symptoms, depression, anxiety, thought suppression, alexithymia and stress have been used for this. As mentioned above, the current study utilised validated measures capturing constructs recognised for their conceptual relationship with mindfulness, that have also been included in other studies of FFMQ validity (e.g., Baer et al., 2006; Bohlmeijer et al., 2011; de Bruin et al., 2012; Veehof et al., 2009), and therefore it is worth considering how these link to each other, depression severity and mindfulness. In addition to depression as discussed above these include experiential avoidance (AAQ), rumination (RRS) and self-compassion (SCS).

5.4.4.2 Levels of experiential avoidance, rumination and self-compassion in moderate to severe, persistent depression

With regards to experiential avoidance, the mean score of the 16 item version of the AAQ (Hayes et al., 2004) was 82.43. This appears comparatively higher than other studies using this version of the AAQ, including a study involving participants with a mild level of depressive symptoms and generalised anxiety disorder (mean AAQ score 75.03: Roemer et al., 2008). The current study sample therefore appears characterised by relatively high levels of experiential avoidance as measured by the AAQ. The mean score on the RRS was 62.33. The author of the RRS has not established any normative scores for this.

However, in the study examining the factor structure of the RRS in which the subscales of Brooding and Reflection were identified the mean score for these was 9.40 and 9.83 respectively, in a sample of community adults (n=1,328: Treynor et al., 2003). This score is substantially lower than those for the current study in which the mean score for Brooding was 14.50 and for Reflection 11.31. It is perhaps unsurprising in a sample with high levels of depression that rumination appears increased compared to a community sample. It is further notable that Brooding, which is associated with more problematic rumination (Treynor et al., 2003) is markedly higher than the subscale Reflection. Rumination scores in the present study are also higher than in those also identified as having persistent depression in a recent study using the RRS (Barnhofer et al., 2014) which found that a total score for this sample was 56.55, and subscales scores for Brooding and Reflection were 12.95 and 11.93 respectively. Comparatively high levels of rumination were accompanied by low levels of self-compassion in the current study, indicated by a mean self-compassion scale score of 1.98. This is substantially lower than previous study samples including community adults attending a self-compassion training programme with a mean SCS baseline of 2.58 rising significantly to 3.47 on completion of this (Neff & Germer, 2013). A further sample of community adults assessed as being just below clinical levels for varying mental health problems including depression were found to have a baseline score on the SCS of 2.56 (Van Dam et al., 2014). A recent comparison of SCS scoring between two groups categorised as never depressed (n=119) and moderately

depressed (n=134) as measured by the BDI highlighted a significant difference of 3.31 & 2.75 respectively (Krieger et al., 2013). Scores of self-compassion in the current study therefore demonstrate comparatively low levels of this, converging with theme analysis findings (subtheme 'Self-Dislike/Self-Criticism'). In summary, scoring across all questionnaires in the current study indicates that the presentation of participants was characterised by high levels of rumination, experiential avoidance and low self-compassion.

5.4.4.3 Correlations between the FFMQ and depression

Overall, correlations between the FFMQ and related variables were consistent with study predictions, supporting the validity of this construct of mindfulness. Correlations between most FFMQ facets and depression as measured by the HAMD and BDI were as anticipated, including the facet Observe which demonstrated a negative, nonsignificant correlation with depression as measured by the HAMD that is nevertheless in the expected direction, and stronger in contrast to previous findings in clinical samples (Veehof et al., 2009; Bohlmeijer et al., 2011). The strength of the relationship between depression and Observe increased and became significant when measured via the BDI. These findings appear to support results of CFA suggesting that Observe behaves similarly to other FFMQ facets in relation to variables measured than in any sample tested thus far (e.g., Baer et al., 2006; Bohlmeijer et al., 2011).

5.4.4.4 Correlations between the FFMQ, AAQ, SCS & RRS

Correlations between the AAQ and FFMQ facets were in line with predictions overall, except that Nonjudge was expected to show the strongest negative relationship with this, as in previous studies (Baer et al., 2006; Bohlmeijer et al., 2011; Veehoff et al., 2011; Cebolla et al., 2012) rather than Actaware. The SCS was significantly positively correlated with all facets of the FFMQ and the strongest relationship was with Nonreact in accordance with previous evaluations of this measure (Baer et al., 2006). In the current study an inverse relationship between these constructs was found as expected. However, a non-significant correlation between the SCS and the HAMD ($r=-0.11$) was found where previous studies examining the correlation between these constructs in non-clinical samples have tended to identify a significant correlation of at least moderate strength (e.g., Yamaguchi et al., 2014; Brown et al., 2014). Nevertheless, a significant and moderate correlation between depression as measured by the BDI and self-compassion was found ($r=-0.37^{**}$) comparable to a recent study measuring depression and self-compassion in a depressed sample (Krieger et al., 2013). Based on a prior study examining correlations between the RRS and the FFMQ (de Bruin et al., 2012), rumination was not expected to show a significant relationship with Observe overall and this was found, though a significant but weak correlation between the RRS subscale Reflection existed. The RRS overall additionally failed to correlate significantly with the facets Describe or Nonreact, though these were in the negative direction as predicted. Whilst the relationship between a capacity for articulating

experience and ruminating may not perhaps be expected to be strong, the lack of a significant correlation between rumination and Nonreact is more surprising given that this facet contains items describing an ability to step back from negative thinking. However, as predicted there was a significant inverse correlation between the subscale Brooding and Nonreact, potentially capturing the tendency of negative and self-critical ruminative thinking to be negatively associated with cognitive and emotional reactivity as represented by the facet Nonreact. In the current study Brooding is more strongly correlated with depression as measured by the HAMD ($r=0.17^*$) than Reflection ($r=0.09$), and is also significantly correlated with FFMQ total score ($r=-0.39^{**}$) whilst Reflection is not ($r=-0.01$). This discrepancy mirrors previous study findings involving a sample with remitted recurrent depression (Brennan et al., 2015) appearing to highlight the importance of Brooding in depression and mindfulness compared to other elements of rumination. Whilst correlations between the FFMQ facets in prior studies relating to the RRS have been statistically significant, overall these correlations have been weak in the only previous study to measure this (de Bruin et al., 2012) and coefficient values are comparable with findings in the current study. It is possible that the nonsignificant relationship between some FFMQ facets and the RRS total score and subscales is explained by the severity of depressive symptoms resulting in an apathetic response to rumination by participants, characterised by a lack of motivation to react to this when profoundly depressed. Apathy and demotivation are listed as core symptoms of major depressive disorder (World Health

Organisation, 1992, American Psychiatric Association, 1994) and may account for the nonsignificant and weak relationship between these variables. Alternatively, rumination may occur without conscious awareness (Koole et al., 1999), impeding consistent responding to items on this measure, leading to a nonsignificant relationship between this and the facet Nonreact. This role of subconscious rumination in interfering with recognition of FFMQ facets is further explored below, in relation to the facet Nonjudge.

Whilst correlations between the FFMQ and related variables were in line with expectations overall, predictions about the relationship between individual facets and other constructs were not all confirmed, principally due to the findings related to Nonjudge. Predictions were made that this facet would show the strongest relationship with depression, experiential avoidance and rumination due to prior study findings investigating psychometric properties of the FFMQ in clinical and non-clinical samples (Bohlmeijer et al., 2011; Christopher et al., 2012; Cebolla et al., 2012; Tran et al., 2013; Baer et al., 2006; Veehoff et al., 2011; de Bruin et al., 2012). However, this facet was instead either unrelated or only weakly correlated with these. Of particular surprise was the correlation between Nonjudge and the HAMD and BDI which was found to be non-significant (HAMD: $r=0.03$; BDI: $r=-0.05$). Study findings therefore suggest that for those experiencing moderate to severe and persistent depression the capacity to bring a non-judgemental stance towards oneself/one's experience operates independently of severity of depressive

symptomatology. This finding is in stark contrast to previous research investigating mindfulness and depression. As identified in chapter two, studies involving non-depressed samples highlight that the facet Nonjudge most strongly and consistently demonstrates a significant negative relationship with depressive symptoms alongside the facet Actaware (e.g., Laurent et al., 2013; Lavender et al., 2011; Raphiphatthana et al., 2015). Nonjudge is further identified as being of particular importance in nullifying the impact of depressive symptoms (Gilbert et al., 2012; Petrocchi & Ottaviani, 2015). This finding, combined with results relating to Nonjudge in CFA, appear to confirm that the facet Nonjudge demonstrates an idiosyncratic pattern of relationships with other mindfulness facets and related variables in a population with more severe and enduring depression than has been tested to date.

5.4.5 The facet Nonjudge and its idiosyncratic role in moderate to severe, persistent depression

The facet Nonjudge contains items referring to self-directed criticism targeting thoughts and feelings judged as inappropriate (Baer et al., 2006). As such, self-criticism as captured within the facet Nonjudge may form part of a personality trait or stable cognitive feature predating onset of depression. Participants in the current study may consequently respond to items within the facet Nonjudge independently of mood or other mindfulness facets, explaining findings relating to CFA and correlational analyses identified above. Such a possibility is potentially supported by numerous studies showing that premorbid personality traits

can constitute increased vulnerability to depressive disorder, including neuroticism, low self-esteem and self-criticism (Klein et al., 1993; Kendler et al., 1993; Coyne et al., 1995; Widiger et al., 1992; Carey et al., 1994; Cloninger et al., 1998; Caspi et al., 1996; Duggan et al., 2003; Blatt & Zuroff, 1992). Those experiencing high levels of neuroticism typically experience irrational thinking and struggle to cope (McCrae & Costa, 1987) and this trait has been implicated in the onset and maintenance of mental health problems, including depression (Zonderman et al., 1989; Hirschfield et al., 1989; Kendler et al., 1993; Tang et al., 2009). A significant amount of research has therefore identified the impact of personality in the development and perpetuation of depression (e.g., Blatt, 2004; Blatt, 1995; Blatt & Zuroff, 1992), and those experiencing clinical perfectionism may be particularly susceptible to this (Sherry et al., 2014). Perfectionism is typified by feelings of inferiority, failure and guilt and is conceptually similar to self-criticism (Dunkley et al., 2003; Powers et al., 2004; Sherry et al., 2014), which in recent years has emerged as a potential predictor of mental health problems including depression, appearing to constitute a pathological personality trait that is related to, but distinct from neuroticism (Dunkley et al., 2009). Different theories of depressive vulnerability therefore propose stable personality or cognitive characteristics increasing susceptibility to depression (Beck, 1987; Blatt, 2004) and trait self-criticism is recognised as a vulnerability factor across disorders (Blatt, 1995). The likelihood of pervasive self-criticism predating the development of depressive disorders is supported by several studies

identifying the detrimental impact of relentless and harsh self-rebuke (Zuroff et al., 2015). Self-criticism is associated with lifetime risk of depression (Murphy et al., 2002) that is moreover found to obstruct (Hawley et al., 2006) and respond slowly to treatment (Blatt & Zuroff, 2005), and elevate risk of relapse (Zuroff, 2005).

Whilst negative self-judgement and criticism may represent a premorbid character trait predisposing the individual to depressive disorder the relationship between the two remains conceptually complex and it is argued that detrimental changes in personality may develop as a consequence of depressed state, rather than as a precursor to depression (Griens et al., 2002). Personality changes potentially resulting from persistent depression may in turn create additional vulnerability to future depression (Coyne & Gotlib, 1983, 1986; Rhode et al., 1990), a consequence that has been labelled the 'scarring' effect (Wichers et al., 2010; Lewinsohn et al., 1981). Whilst numerous studies find that changes in personality occurring within the context of depressed mood recede on recovery from this (Ormel et al., 2004; Segal & Ingram, 1995), there is increasing evidence that some significant personality changes may endure beyond a depressed state. For example, a recent study reported that some personality traits demonstrated post morbid changes including an increase in neuroticism (Rosenstrom et al., 2015), which has been identified as an aspect of personality positively related to depression (e.g., Zonderman et al., 1989). It is postulated that such changes may occur as the result of an accumulation of depressive

episodes (Akiskal et al., 1983), and that these have not been observed in prior studies due to only short-term follow-up (Rosenstrom et al., 2015). Permanent changes in personality or cognitive processing styles occurring as a result of depression may include an increased capacity for self-judgment and criticism and influence responding to the facet Nonjudge, such that items are rated without reference to mood or other facets of mindfulness, representing instead a feature of personality that has become independent of these variables. Such a possibility would explain unexpected findings relating to Nonjudge in the current study. However, pre and/or post morbid trait-like self-judgement and criticism occurring in the context of depressive disorder explaining current study findings relating to Nonjudge is undermined by previous studies exploring the FFMQ and its psychometric properties. Specifically, studies involving samples with depressive disorder report that Nonjudge correlates strongly with depression and other mindfulness facets (Bohlmeijer et al., 2011; Williams et al., 2014). These involved samples predominantly from primary care settings, and it is therefore conceivable that these included participants with less chronic and complex depression, with a correspondingly reduced capacity for pervasive and enduring self-criticism.

Initial attempts to identify characterological factors in the form of dysfunctional attitudes believed to constitute cognitive vulnerability to depression were undermined by findings that these returned to premorbid levels once depression remitted and consequently appeared

to be a state phenomenon (e.g., Blackburn et al., 1986; Hollon et al., 1986; Lewinsohn & Rosenbaum, 1987). However, subsequent studies highlight that dysfunctional and negative attitudes are evident in those with a depressive history but only once reactivated by even small, non-clinical reductions in mood (Segal & Ingram, 1995). Once this occurs it is potentially exacerbated by an increased propensity to respond by ruminating, self-devaluative and critical thinking, as previously discussed (Teasdale, 1999; Segal et al., 2013; Nolen-Hoeksema, 1987; Nolen-Hoeksema, 1991). Results of criterion related validity in the current study found a negative and significant correlation between the Rumination Response Scale (RRS) and Nonjudge as anticipated ($r=-0.27$, $p < 0.01$), indicating that high levels of rumination and an accepting attitude towards oneself are unlikely to simultaneously coexist. Both self-judgement and ruminating on depressive symptoms therefore seem significantly related. This may be unsurprising given that the content of the facet Nonjudge highlights discrepancies between desired and actual thoughts and feelings, the identification of which is likely to be responded to by ruminating (Martin et al., 1993). Items within this facet appear similar to the concept of ruminative analytical self-focus defined as thinking about oneself and ones symptoms (Rimes & Watkins, 2005). In particular, items within the RRS subscale Brooding overlap with self-criticism, implying negative self-judgment and critical statements (Rude et al., 2007). In this way the content of the facet Nonjudge may form both the trigger and content of ruminative thinking. The significant correlation between these constructs in the current study supports this possibility.

Furthermore, the subsequent drive to resolve the criticism and sense of failure inherent within items of the facet Nonjudge potentially explains participants reporting of relentless and uncontrollable thinking as highlighted in the qualitative theme 'Ruminating, Worrying and Relentless Thinking'.

Unwanted thoughts and feelings and self-criticism associated with these as captured by the facet Nonjudge may therefore become a primary focus of ruminative thought as cognitive resources are directed to resolve the discrepancy between actual and desired thoughts and feelings. Goal related thoughts are prioritised as topics of rumination (Martin & Tesser 1996) and though appearing to occur deliberately as a goal directed behaviour, rumination may be instigated automatically without conscious intention, taking place outside of awareness as an unintentional mental process (Bargh & Gollwitzer, 1994; Koole et al., 1999). As a likely component of ruminative thinking, it is possible that processes captured within Nonjudge also take place without conscious awareness and a further explanation for current study findings relating to Nonjudge includes the possibility that this interferes with recognition and subsequent completion of Nonjudge items. As highlighted through theme analysis, changes in awareness of internal and external events are identified as a significant feature of depression, captured in the subtheme 'Reduced Awareness', supporting an explanation that participants are unaware of self-criticism for unwanted thoughts and feelings as operationalised by Nonjudge when mood is low. Whilst this

explanation may be undermined by the fact that all subscales of the RRS significantly correlate with both the HAMD and the BDI, it is possible that the self-critical and judgmental elements of ruminative thinking are experienced with less awareness than other components of ruminative thinking.

Those with a tendency to self-criticism are less able to recognise this as a psychological thought process and responses to this are characterised by a submissive attitude (Whelton & Greenberg, 2005). The pathogenic qualities of self-criticism have been linked to the degree of self-directed hostility, contempt and self-loathing that permeates this (Whelton & Greenberg, 2005; Zuroff et al., 2005). As reported in the previous chapter, theme analysis in the current study highlights the powerful sense of self-loathing, hostility and criticism that participants repeatedly direct towards themselves, and this is clearly a predominant feature of their depressive experience. The tone of self-disgust and recrimination captured in participant quotes indicates their perceived lack of self-worth and sense that they deserve to suffer in this way, as found in previous studies (e.g., Heimpel et al., 2002). Such self-criticism therefore appears endorsed by participants as an unchallenged assessment of their worth. A tendency to regard negative thoughts about the self as accurate representations of reality may result in self-criticism not being recognised as a judgement by participants, with subsequent inconsistent scoring of Nonjudge items. Responding to Nonjudge items from this perspective

could therefore potentially account for its nonsignificant relationship to depression and other mindfulness facets.

Previous studies found that the relationship between Nonjudge and depression was the strongest of all facets, including those presenting with mild-moderate depression (Bohlmeijer et al., 2011), making findings in the current study particularly surprising. Another possible reason for the statistically nonsignificant relationship between Nonjudge, other facets of the FFMQ and depression is the possibility that in those with a substantial level of persistent depression the content of Nonjudge, capturing elements of self-criticism, is cognitively avoided by participants in a deliberate effort to minimise distress associated with this. Self-critical thoughts involving themes of worthlessness and inadequacy are a fundamental and painful aspect of clinical depression (NICE, 2009). In the current study 'Self-Dislike/Self-Criticism' is identified via theme analysis as a predominant and intensely painful characteristic of participants' depression. In the face of such distressing experience a potentially logical step is to attempt to suppress this in order to overcome or avoid contact with this. In this way awareness of self-criticism for 'irrational' thoughts and feelings as captured by Nonjudge items may be impeded as depression reaches a threshold encouraging suppression of one of the most distressing aspects of this; self-criticism, blame and judgement. The content of other facets may not be suppressed to the same degree due to the lack of self-judgement and criticism within these making avoidance less necessary. Such suppression may consequently

only influence response to Nonjudge items. Prior studies examining the psychometric properties of the FFMQ involved samples with either only mild-moderate depression or recurrent depression in remission at time of participation and consequently a facility for active suppression of processes operationalised by the facet Nonjudge may not have reached sufficient threshold to be triggered.

In summary, several explanations for the unexpected and novel findings relating to Nonjudge in the current study have been put forward. These include premorbid and/or post morbid changes in personality traits leading to items on the subscale Nonjudge to be responded to independently of other mindfulness facets or depressive symptoms. Alternatively, Nonjudge items may fail to be recognised accurately by participants due to habitual and ingrained self-criticism altering the meaning of items for those with a substantial level of persistent depression. It has further been posited that self-criticism and blame, as captured by Nonjudge, acts as an element of rumination, and consequently fails to be recognised due to its partially subconscious occurrence or that it may instead be deliberately suppressed due to its uniquely distressing content. However, whilst all such explanations potentially account for study findings, all are supported only minimally by empirical studies and their hypothetical status is therefore emphasised. Further study is required if confidence in explanations advanced is to be increased in the future.

5.4.6 Suppression of mindfulness: Exploring its role in moderate to severe, persistent depression

One of the explanations above for results related to Nonjudge was based on the study finding indicating that some participants actively suppress perceptual awareness. The qualitative subtheme 'Deliberate Reduction in Awareness' suggests that people with persistent and substantial levels of depression intentionally manipulate levels of awareness in an effort to protect themselves from contact with distressing phenomena. Whilst the term awareness is not synonymous with mindfulness, participant descriptions supporting this subtheme clearly relate to important aspects of the construct of mindfulness as conceptualised by the FFMQ. Consequently, when participants are commenting on their deliberate reduction in awareness, they are also referring to a restriction of aspects of mindfulness. In particular, participant comments about restricting awareness appear to relate to the facet Observe which includes items capturing observation of aspects of present moment experience including bodily sensations, sounds, smells, sights, thoughts and emotions. Participants' descriptions of depressive experience highlights their deliberate attempts to exclude awareness of these elements during episodes of depression. Whilst the author was unable to identify literature referring to people with depressive disorder describing an intentional constriction of mindful awareness, participants' comments indicate that this strategy appears linked with the use of cognitive suppression and experiential avoidance.

Several studies link experiential avoidance with a range of mental disorders (Hayes et al., 2004; Tull et al., 2004; Cribb et al., 2006), including persistent depression (Barnhofer et al., 2014). Experiential avoidance consists of attempts to avoid internally generated experiences such as thoughts, feelings and bodily sensations regardless of the impact of this (Hayes et al., 1999). The similarities between qualitative findings suggesting an intentional reduction in awareness and experiential avoidance are supported by the measure the AAQ. This contains content seeming directly linked to a desire to reduce awareness in line with the subtheme 'Deliberate Reduction in Awareness', with items relating to suppressing thoughts and feelings by not thinking about them, controlling and avoiding anxieties, worries and emotions. Quantitative results in the present study highlight the high levels of experiential avoidance in participants and the negative relationship between this and mindfulness facets, supporting a positive association between reduced awareness and experiential avoidance in this population.

Participants in the current study spoke of the use of drugs and alcohol as a method for reducing awareness of unwanted thoughts and feelings as identified in the subtheme 'Deliberate Reduction in Awareness', and experiential avoidance has been also identified as prompting the use of these as a means of escaping or distracting from aversive experiences (Polivy & Herman, 2002). In addition to a 'Deliberate Reduction in Awareness', the existence of experiential avoidance in the present study is suggested by the subtheme 'Behavioural Withdrawal' in which

participants describe avoiding contact with people and external environments as a method of protecting themselves from negative experiences and feelings associated with depressed mood. As such this subtheme could be construed as a physical manifestation of the desire to reduce levels of perceptual awareness in the face of deteriorating mood. Whilst this may be employed as a method for coping with depressed mood, it also reduces opportunities for engagement in mood enhancing activities and provides further ammunition for self-criticism and feelings of failure, as participants fail to engage in social, occupational and leisure activities. A sub-theme that therefore appears implicated in the continuation of depressed mood is the tendency of individuals to behaviourally withdraw in the face of deteriorating mood. The role of this is recognised by therapies for depression which may begin with helping individuals to reverse this tendency through activity scheduling (Beck et al., 1979). A number of previous qualitative studies echo current study findings by highlighting the tendency of people experiencing depression to withdraw behaviourally and socially (e.g., Rice et al., 2011), which is likely to reduce opportunities for enjoyable activities (Amini et al., 2013), and create additional stress for sufferers further exacerbating depressed mood. Whilst withdrawal may be motivated by a desire to avoid being seen as vulnerable or 'weak' (Heifner et al., 1997), improving social connections and family relationships may be considered a priority goal by people with depression (Battle et al., 2010) and some participants in the current study recognised the advantages of re-engaging with social activities. However, despite recognising the potential benefits of

becoming more socially and behaviourally active, participants in the current study consistently described isolating themselves from others as an immediate reaction to the onset of depression. This appears to be a practical attempt to avoid contact both physically and perceptually with unwanted situations that may provoke further distress.

Other experientially avoidant strategies utilised by participants in the current and prior studies include engaging in distracting activities and attempts at cognitive suppression (Brownhill, 2005; Segal et al., 2002). Cognitive suppression can be conceptualised as a type of experiential avoidance, referring to the deliberate removal of thoughts from awareness (Beevers et al., 1999), and is theorised to represent a strategy employed by people with a range of mental disorders, including depression, to manage the distress associated with these (Wenzlaff, 1993). As such, thought suppression appears to substantially overlap with the subtheme 'Deliberate Reduction in Awareness', which contains participants' descriptions appearing to indicate an intention to avoid contact with their thoughts. However, despite its intentional use as a method for avoiding negative and upsetting cognitive material, thought suppression may instead increase frequency of unwanted thoughts (Wenzlaff & Wegner, 2000). The 'ironic processes theory' (Wegner, 1994) posits that during periods of low mood the increased cognitive demands arising from this potentially overwhelms the individual's usual capacity to successfully avoid and distract from negative thoughts. Whilst the intentional ability to distract and escape from unwanted cognitive

material reduces in the face of deteriorating mood, the automatic search for negative thoughts continues in an effort to identify material that requires resolving via intentional distraction (Wenzlaff & Wegner, 2000). However, this only serves to increase access to negative thoughts at a point when the ability to distract from them is severely impaired (Watkins & Moulds, 2009). In this way cognitive suppression may inadvertently result in a profusion of unwanted thoughts and aggravate existing depression (Beevers et al., 1999). Suppression of thoughts has been associated with an increased risk of depression and anxiety in numerous studies (Purdon, 1999; Wenzlaff & Wegner, 2000) and several demonstrate a strong, positive correlation between chronic thought suppression and depression (Spinhoven & van der Does, 1999; Wegner & Zanakos, 1994; Wenzlaff et al., 2001; Wenzlaff et al., 2002).

Theories relating to cognitive suppression suggest a further explanation in addition to those already advanced accounting for the unexpected findings related to the facet Nonjudge. This includes the possibility that, in those with high levels of depression, Nonjudge has replaced the facet Observe by becoming the primary target of self-focused attention and associated processes including cognitive suppression. As previously discussed, the facet Observe was hypothesised in those without meditation experience to represent a form of maladaptive self-focused attention, explaining its positive relationship with psychological symptoms and nonsignificant relationship with other facets of mindfulness (Baer et al., 2006). However, in a sample with substantial

levels of depression it is possible that maladaptive self-focused attention shifts from Observe to Nonjudge, as attention naturally becomes focused onto signs indicative of depressed mood, as represented by Nonjudge items. A preoccupation and active focus on one's cognitive and emotional state would seem natural during unwanted episodes of debilitating low mood, and negative material related to this, as captured by Nonjudge, would seem a priority target for the automatic monitoring function of cognitive suppression as identified in 'ironic processes theory' (Wegner, 1994). Therefore, in a population with substantial levels of depression, the focus of maladaptive self-focused attention and associated cognitive suppression may have shifted from the facet Observe to Nonjudge. Such a possibility would explain the unexpected findings that Observe loads onto an overarching factor of mindfulness in this population whilst Nonjudge does not.

The paradoxical effects of attempts to suppress thoughts and feelings potentially illustrates how the use of such emotion regulation strategies may maintain and aggravate depressive symptomatology (Dalgleish et al., 2009; Ingram et al., 1998). Thought suppression has been positively associated with rumination in correlational analyses (Watkins & Moulds, 2009) and high suppressors have been found to experience high levels of rumination (Wenzlaff & Luxton, 2003). Although it seems counterintuitive that rumination and thought suppression should be positively associated, the paradoxical increase in unwanted thoughts resulting from failed attempts at suppression may trigger rumination in a

further maladaptive attempt to effectively manage the depressive experience (Wenzlaff & Luxton, 2003). This is likely to be accompanied by additional self-criticism as failures in thought control may be attributed to personal weakness (Clark & Purdon, 2009), and participants in the present study spoke of their frustration at their inability to disengage from ruminative thinking. Increases in rumination may in turn trigger efforts to cognitively suppress, creating a cycle of suppression-rumination that unwittingly aggravates depressed mood. Such a possibility would fit with existing models of depression (e.g., Nolen Hoeksema et al., 1991) and current study findings highlighting the simultaneous coexistence of deliberate efforts to suppress awareness and high levels of ruminative and repetitive thinking in qualitative themes (subthemes: 'Deliberate Reduction in Awareness' & 'Ruminating. Worrying and Relentless Thinking') and the predominantly negative correlations between facets of mindfulness and rumination in statistical analyses. The apparent dominance of ruminative and relentless thinking in response to depression (Amini, 2013, Smith & Rhodes, 2015), is found in this study to contribute to a worsening and continuation of depressed mood and participants describe this as another undesirable and upsetting aspect of their depressive experience. Furthermore, absorption in agitated and relentless thinking presents another obstacle to the ability to observe present moment experience, including awareness of positive phenomena (subtheme: 'Preoccupation with one's thoughts precludes awareness of everything else'), potentially assisting the continuation of depressed mood.

5.4.7 The role of facets of mindfulness in moderate to severe, persistent depression

The facet Nonjudge contains items relating to observation of unwanted thoughts and feelings and self-criticism for these. Given that depression is characterised by the very presence of unwanted thoughts and feelings and is usually accompanied by intense self-criticism (World Health Organisation, 1992, American Psychiatric Association, 1994), it is highly probable that the onset of depression is marked by reductions in the facet Nonjudge and the level of Nonjudge in the current study was the lowest of any involving the FFMQ to date. The presence of depression-related self-criticism is further supported by the identification of the qualitative theme 'Self-Dislike/Self-Criticism' in which participants speak of a profound sense of self-loathing accompanying their depression. Moreover, several participant quotes highlight that their self-criticism relates to the existence of depression as well as their perceived failure to manage this, appearing to closely represent the processes captured by the facet Nonjudge. The impact of depression on processes captured by the facet Nonjudge may consequently prompt a drive to reduce levels of present moment awareness, in order to avoid contact with the negative and distressing material within this facet, as mood begins to deteriorate and self-critical, ruminative thinking escalates. Participants in the present study describe a profusion of judgemental and self-critical thoughts and subsequent suppression of observation of these would appear a logical response. However, whilst deliberate suppression of observation of

experience as represented by the facet Observe appears to be an attempt to manage depressive experience it has several potential pitfalls. These are reflected in participant quotes suggesting that not only is negative material suppressed, but awareness of positive phenomena, including thoughts and feelings, is also obstructed, thereby reducing contact with experiences that may counteract depressed mood. In this way a strategy of deliberately restricting awareness to protect oneself from upsetting thoughts and feelings associated with depression appears to represent a 'sledgehammer to crack a walnut' approach in which this fails to be applied selectively to only negative material, potentially resulting in the exacerbation of depression rather than its intended relief. It is alternatively possible that rather than a failure to target specifically negative emotional material for suppression, participants are instead deliberately attempting to avoid all emotions (Hayes et al., 1996), including positive ones, as has been found in prior studies of emotion suppression (Bebblo et al., 2012). This may in part be driven by a belief that they do not deserve to have positive experiences, a possibility supported by theme analysis in the current study (subtheme 'Self-Dislike/Self-Criticism') and so seek to suppress all experiences (Bebblo et al., 2012), an outcome that is nevertheless ultimately associated with further negative affect (Butler et al., 2003; Campbell-Sills et al., 2006; Gross & Levenson, 1997; Nezlek & Kuppens, 2008).

In addition to the apparently intentional suppression of observation of experience as represented by the facet Observe, awareness of this facet

may be further obstructed by additional cognitive strategies dominating consciousness during episodes of substantial depression identified in both the current and previous studies (e.g., Amini et al., 2013; Smith & Rhodes, 2015). As stated above, during periods of depression, rumination and suppression may be utilised in a misguided attempt to resolve the discrepancy between actual and desired mood state, severely impeding awareness of other aspects of experience as suggested by the subtheme 'Preoccupation with one's thoughts precludes awareness of everything else'. The narrowing of attentional focus arising from both deliberate efforts to suppress and secondary to absorption in relentless thinking is likely to ensure that opportunities for engagement with mood enhancing phenomena are increasingly limited, and may constitute a factor maintaining and deepening depressed mood. The drive to avoid perceptual contact with distressing experience may additionally prompt behavioural avoidance (subtheme: 'Behavioural Withdrawal') with a subsequent lack of exposure to experiences that may assist recovery, such as social or leisure activities (Hayes et al., 1996), potentially providing yet more opportunities for engagement in ruminative thinking and associated self-criticism. A combination of these processes may subsequently result in a corresponding reduction in remaining facets of the FFMQ. Specifically, the capacity for nonreactive (as operationalised by the facet Nonreact) attention to present moment experience is likely to be negatively affected by continuous engagement in cognitive and behavioural strategies to eradicate unwanted emotional and cognitive experiences representative of depressed mood. High

levels of rumination and experiential avoidance as signified by both statistical measures and qualitative themes in the current study are therefore strongly indicative of a substantially limited ability to adopt a nonreactive stance to experience during a depressive episode. Such a process appears representative of cognitive reactivity, involving a ruminative and self-critical tone to thinking that may potentiate depression in vulnerable individuals (Segal et al., 2006).

These processes are similarly likely to interfere with awareness of immediate experience (as operationalised by the facet Actaware), as awareness is potentially dominated by ruminative thinking and a depression-related tendency to operate on 'autopilot' (Segal et al., 2013). In addition to the impact of repetitive ruminative thinking on levels of the facet Actaware, it is probable that a capacity for focused attention is negatively affected by a concurrent drive to avoid perceptual contact with experience. Deterioration in processes represented by the facet Actaware may therefore, for some participants, be further assisted by the active suppression of awareness as captured in the subtheme 'Deliberate Reduction in Awareness'.

Theme analysis also revealed participants' difficulties with organising thoughts, short term memory and aspects of cognitive functioning as captured in the subtheme 'Changes in Cognitive Performance'. Loss of concentration, memory, cognitive performance including reduced fluency of speaking and ability to find words have also been identified as sub-

themes in other qualitative studies, consistent with findings in the current study (Fossati et al., 2003; Rice et al., 2011., Amini et al., 2013). As such, depression related declines in concentration and memory functioning combined with reduced awareness of present moment experience may negatively affect the ability to articulate experience (as operationalised by the facet Describe), contributing to the low levels of this facet found in the current study. Participants also highlight that changes in cognitive performance may provide more ammunition for self-criticism and further aggravate depressed mood.

In summary, the intentional pursuit of a state in which awareness is profoundly constricted may involve a process of manipulating processes as captured by the FFMQ facet Observe as a strategy for avoiding contact with distressing depressive experiences, including self-dislike and criticism as operationalised by the facet Nonjudge. In turn, this may lead indirectly to further reductions in processes captured by other FFMQ facets, via engagement in self-defeating strategies of experiential avoidance, suppression and rumination. Whilst participant interviews indicate that reducing awareness can be instigated intentionally as a self-protective strategy, the ensuing state of 'perceptual nihilism' is spoken of as a distressing experience. This potentially further compounds depression through increasing participants' sense of separation from internal and external experiences, and takes people further away from experiences that may counteract the problem. These factors potentially combine to ensure the escalation and perpetuation of depressive

symptoms and accompanying self-criticism, rather than their amelioration. Such a possibility, though speculative, may explain low levels of mindfulness found in this study sample and partially clarify the role and behaviour of mindfulness in moderate to severe, persistent depression.

5.5 Significance, strengths and limitations of the study

This study appears to be the first to assess the psychometric properties of the FFMQ in people with moderate to severe, persistent depression. Investigation of the validity of the FFMQ indicates that a four factor model of mindfulness (excluding Nonjudge) is more applicable for this population, and should be utilised in such samples in the future. This study also appears to be the first to explore the role of mindfulness in depressive disorder from the perspective of participants who were naïve to mindfulness training, highlighting that important aspects of mindfulness seem to be deliberately suppressed during depressive episodes. Qualitative analysis provided some support for quantitative findings, suggesting potential explanations for the novel findings of a four factor structure in this population. A considerable strength of this study therefore was the mixed method, convergent parallel design. This method enabled the integration of quantitative and qualitative approaches allowing for potentially greater understanding of the role of mindfulness in depression than if either method were used alone (Doyle et al., 2009). This study adds to the limited number of mixed method studies in existence focusing on the role of mindfulness in depression.

Whilst the concurrent use of the two methods obtained different streams of data, findings appear to converge in important areas and enhance our understanding of this important topic.

Prior psychometric evaluations of the FFMQ concerned mostly samples involving students (e.g., Baer et al., 2006), meditators (e.g., Baer et al., 2008), those with mild to moderate depression (Bohlmeijer et al., 2011), and remitted recurrent depression (Williams et al., 2014). Whilst prior studies had utilised samples with greater numbers, ranging from 197 (Baer et al., 2008) to 1,284 (Tran et al., 2014), power calculations indicated the sample size in the present study was sufficient ($n=187$) for statistical testing evaluating reliability and validity, and it can therefore be argued that the current findings may be used to reliably draw inferences from these. However, although the depressed sample was adequate for the study aims, and participants were recruited from three sites in the UK, the results from this study cannot be generalised to the wider clinical population. The quantitative study sample was also limited due to the lack of data collection of some important areas of demographic information. For example, the study design did not include collection of data about ethnicity, undermining attempts to generalise findings beyond the study sample to a UK population, and represents a further limitation.

The predetermined data collection points of T1 and T2 meant that test retest reliability was measured with a 6 month gap. During this period participants were receiving treatment for depressed mood, a factor that

may have affected scoring on the FFMQ and potentially influence test retest reliability as a result. The unequal size of the two quantitative samples is also a limitation, restricting comparison between these and parity of statistical testing between groups. Specifically, CFA with the healthy control group (n=33) was not feasible. Therefore, in addition to recruitment of a bigger depressed sample, the current study would have benefited from a larger control group but due to resource and time constraints this was not possible. Furthermore, the primary purpose of the inclusion of the control group was to act as a contemporaneous comparison to the depressed sample, rather than to test the construct of mindfulness via CFA, as this has already been done extensively with healthy samples (e.g., Baer et al., 2006), and the aim of the current study was to test this in those with substantial levels of depression. The control group had an almost total absence of depressive symptomatology as measured by the HAMD and BDI. Whilst this may lower than most control samples previously identified as healthy volunteers (e.g., Parkin et al., 2014; Barnes & Lynn, 2010; Miyata et al., 2015) this potentially accentuates the difference between the samples, thereby confirming the apparently opposing relationships between mindfulness and depression. A possible factor influencing the unusually low scores of depression symptomatology in the healthy control group may have been the participants' desire to confirm their positive mental health in order to contribute to the study. A further possibility influencing correspondingly low scores on measures of depression and high scores on the FFMQ might be that this sample contained many participants with extensive

meditation experience. Such a possibility is supported by the fact that prior studies of 'meditators' (e.g., Baer et al., 2008) have similarly high scores on the FFMQ as identified above in table 23. The failure to collect information about meditation experience for the healthy control group and also for the depressed sample represents a further limitation of this study.

The study to which the depressed sample were recruited (CLAHRC study) was a RCT focusing on the intensive delivery of treatments for persistent and substantial depression for those in secondary mental health services. A recent local audit highlighted the poor availability of recommended treatments for this population (Morriss et al., 2010; Balain et al., 2012). It is possible that participants' completion of self-report measures used for psychometric analyses were influenced by a desire to ensure eligibility for the RCT and subsequent access to sought after treatments within this: expert pharmacological prescribing and CBT. Such a possibility would form a source of bias as participants overstate severity of symptoms at baseline to ensure inclusion in the trial. However, the use of both self-report, assessor ratings and referral dependent on clinical diagnosis ensured that participants entering this study had a substantial level of depression measured as of at least moderate severity.

The demographic profile of the qualitative sample aimed to reflect the overall sample from which they were drawn. However, the qualitative

sample consisted of a majority of male participants, whereas the sample from which they were drawn consists mostly of women and this was not therefore accurately representative of the total sample. Recruitment of participants for qualitative interviews involved confirming that these had not been through a mindfulness-based programme to reduce the possibility that participants' depressive experience was influenced by mindfulness practice. However, whilst it was intended to recruit only participants who were naïve to mindfulness training, many of these had been through a structured psychological intervention, predominantly CBT. As previously stated, CBT is in part proposed to be effective for depression because of its cultivation of meta-cognitive awareness, reflecting a mindful perspective (Segal et al., 2013). Participants' may not therefore have been completely naïve to mindfulness as intended and their accounts of depressive experience may be partially informed by a mindful perspective, influencing findings. However, the increasing availability of CBT and mindfulness interventions means that recruiting those with protracted experiences of depression in mental health services without exposure to such therapies is unlikely, and reflects the pragmatic approach of the RCT from which the participants' were drawn.

The use of theme analysis meant that themes could be identified inductively or deductively (Frith & Gleeson, 2004), and whilst questions became increasingly focused throughout interviews these nevertheless allowed for exploration and were designed to pick up unexpected issues, as well as more predictable topics relating to mindfulness and

depression. Therefore theme analysis was able to explore areas unsuitable for quantitative analysis, due to the assumptions necessitated by the methods utilised within a quantitative approach. Theme analysis consequently allowed new, inductive information to be discovered about the suppression of mindfulness, and its use is a strength of the study. Qualitative findings are nevertheless the result of analysis by a researcher with a particular background and training involving healthcare, cognitive therapy and mindfulness, alongside additional cultural and societal factors likely to influence the researcher's perspective such as age, gender, race etc (Blaxter et al., 2010). This can be regarded as both a strength and a limitation. For example, the background and training of the researcher meant that issues related to depression and mindfulness may have been more readily identified. His background in mental health and therapy also appeared to enable the rapid development of rapport allowing for the disclosure of relevant personal material. The researcher's background will also have influenced the researcher's focus, thereby potentially restricting the emergence of alternative perspectives and themes. However, qualitative analysis of this data involved the inclusion of a second non-clinical rater (CB). 25% of transcripts were independently coded by the second rater and total interrater agreement was established (100%). Transcripts and codings were also viewed by the researcher's supervisors (PC and RM).

A factor potentially limiting credibility of qualitative analysis is that interviews were conducted a minimum of 12 months post entry into the

study and completion of measures for analyses. This means that participants were asked about their experience of depression at a point when most of them described being considerably recovered from depressed mood. The possibility that memory bias substantially influences participants' accounts cannot therefore be ruled out, leading to identification of themes based on a misrepresentation of experience, due to inaccuracies and distortions of memory associated with depressive disorder (Watkins et al., 2000). However, interviewing participants on entry into the study would have also had substantial disadvantages, including potential difficulties gathering detailed information about depressive experience at a point when participants' ability to recall and articulate experience is likely to be significantly impeded by limitations in memory performance associated with depression (NICE, 2009). Moreover, the act of interviewing people about their experience of depression may have interfered with the intervention being offered as part of the RCT and unduly influenced outcomes of this. Qualitative interviews could consequently only take place once the active intervention phase of the trial was completed.

Our understanding of the relationship between mindfulness and depression would benefit further from the use of a wider range of questionnaires. All of the questionnaires in the current study have been used in previous psychometric analyses of the FFMQ (e.g., de Bruin et al., 2012), though the current study did not include use of the White Bear Suppression Inventory (Wegner & Zanakos, 1994), which was included

in the original validation study (Baer et al., 2006). Study findings highlight the potential importance of the role of deliberate suppression of mindful awareness as an aspect of depressive experience and in hindsight the inclusion of this measure would have assisted greater understanding of the role of this construct in moderate to severe, persistent depression.

5.6 Implications of the study

5.6.1 Implications for the treatment of moderate to severe, persistent depression using mindfulness-based approaches

Results from the methodological component of this study indicate that a four facet construct of mindfulness is preferred in those with moderate to severe, persistent depression; the facet Nonjudge does not statistically relate to level of depressive symptomatology or to an overarching construct of mindfulness in this population. Possible explanations for this have been provided above and highlight that during episodes of enduring and substantial depression the depression-related content of Nonjudge and its likely association with self-critical thoughts and feelings might mean that this aspect of experience requires particular consideration. Interventions focusing on the use of mindfulness in this population may therefore benefit from a greater emphasis on strategies to assist moderate to severely depressed participants in recognising the typically negative and self-critical tone accompanying severe depression and develop a greater level of self-compassion in response to this. A self-compassionate response to cognitive reactivity is theorised to be an

important aspect of mindfulness-based approaches for those with remitted recurrent depression (Kuyken et al., 2010), and current study findings imply that impairments in this capacity may be of even greater significance in moderate to severe, persistent depression. Alterations in mindfulness-based treatments may therefore be required to address this possibility.

Findings from the current study indicate several issues requiring consideration in the use of mindfulness-based approaches for the management of high levels of persistent depression. For example, the present study findings suggest that as depression intensifies depressive experience consisting of negative thoughts and feelings is potentially responded to with a concerted attempt to suppress it. This suppression of depressive experience seems to be linked to a marked reduction in the facet Observe. However, attempts to manipulate elements of mindfulness to cope with depressive experience may only serve to exacerbate it while the benefits of turning towards depressive experience, rather than continually attempting to escape from it is observed by participants in previous qualitative studies exploring the impact of mindfulness interventions (Malpass et al., 2012; Wilkinson-Tough et al., 2010). Theme analysis in the present study also highlights that some participants describe being aware of the advantages of reversing the tendency to shut off from internal and external experiences and also identified that increasing mindful awareness might counteract depressed mood. As described previously, there are a number of

therapeutic interventions which purposefully attempt to reduce suppression (e.g., Segal et al., 2013) and the identification of the potential benefit of this by participants adds credibility to their use. However, the persistent and automatic reluctance to be aware of experience accompanying depression is likely to interfere with attempts to increase mindfulness within these approaches, especially in those with moderate to severe depression and its use may require particular attention in this population. For example, mindfulness-based approaches for this population may potentially be adapted to include a greater emphasis on developing insight into the process of suppression of awareness and its potentially negative consequences early on in treatment.

The overwhelming nature of agitated and ruminative thinking identified in the present study highlights the potential difficulties and resistance that may be encountered if attempting to teach participants to detach from this style of thinking. Theme analysis suggests that this is no easy matter for participants, despite their recognition of its disadvantages and desire to be free of this. The recognition of the possible benefits of adopting a more mindful perspective during such periods appears negated by a compulsion to focus cognitive resources almost exclusively on ruminative thinking. Recognition of the impact of rumination in triggering and maintaining depressive episodes is a basis for MBCT as it aims to teach participants to disengage from this style of thinking and thereby avoid relapse (Segal et al., 2013, Teasdale et al., 2000). Studies identified

previously (see chapter two) highlight the role of mindfulness-based approaches, including MBCT, in reducing rumination through increasing mindful awareness (e.g., Kingston et al., 2007). Findings from the current study appear to add credibility to the deployment of such interventions for this population, though perhaps indicate that this may be more challenging for those with heightened levels of active depression.

Whilst consideration of adaptations to mindfulness-based approaches may be given in the light of current study findings, it may be instead helpful to consider addressing active levels of depression with alternative treatments, such as traditional cognitive behaviour therapies. MBCT for depression was designed to be taught to people when in remission, and whilst several trials indicate that it can be helpful for more severe levels of depression (e.g., Barnhofer et al., 2009) it may be that for those with more intractable and substantial forms of depressive disorder that processes involved in its maintenance make the application of mindfulness problematic. Alternative interventions focusing on assisting participants to engage in practical tasks, such as activity scheduling, may more effectively assist the detachment from ruminative, self-critical thinking and provide opportunities for engagement in mood enhancing activities. An implication for the clinical application of mindfulness in moderate to severe, persistent depression is that its use may therefore be more advantageous when people have recovered somewhat from this, as originally intended (Segal et al., 2002).

Whilst possible implications arising from the current study for the use of mindfulness in substantial and longstanding depression have been identified, any such adaptations or alterations to current approaches are potentially premature given the tentative and hypothetical nature of explanations for study findings that have yet to be replicated. Future research may assist further clarification about these issues.

5.6.2 Implications for future research into the role of mindfulness in moderate to severe, persistent depression

Findings from previous psychometric investigations suggest that Observe should be dropped from the FFMQ when used in those without meditation experience (e.g., Williams et al., 2014). However, current study findings highlighted that retaining Observe, and instead removing Nonjudge yielded the best fit for the data. Current study findings therefore indicate that a four factor version of the FFMQ (excluding Nonjudge) may be the preferred model for use in those with moderate to severe, persistent depression. However, using the FFMQ to measure change associated with treatments, including mindfulness-based approaches in this population is potentially complicated by apparent alterations in the factor structure depending on meditation experience (Observe: Williams et al., 2014) and level of depression (Nonjudge: Current study). Future research is therefore needed to examine whether severity of depression is responsible for the changed factor structure of the FFMQ as proposed above. In light of study limitations identified in the previous section, future research could potentially focus on a strategy of

recruiting a moderate to severely depressed sample and following them up into recovery. This may enable clarification of changes in FFMQ factors, particularly Nonjudge and Observe, as individuals move from moderate to severe depression into remission, indicating whether such changes are the property of high levels of depression, as suggested by current study findings, or are instead influenced by other factors unrelated to this. The severe and persistent nature of depression experienced by this population means that substantially more participants would require recruiting if sufficient numbers were to attain remission allowing for comparison of CFA.

The suggested design involving follow up of participants from episode into remission could be mirrored in a qualitative study interviewing participants' during episodes of substantial and enduring depression and repeating this once remission from depression has been achieved. Such a design may highlight whether descriptions of their experience of mindfulness alters in association with mood state, further clarifying the relationship between these constructs. In addition to interviewing those with depressive disorder, qualitative exploration of the role of mindfulness in non-clinical fluctuations in mood in healthy volunteers may further clarify the relationship between mindfulness and depression.

The identification of deliberate suppression of mindful awareness as a strategy for coping with depressive experience suggests that the development of a measure capturing this construct would assist future

study into this area and may further clarify its role in depressive disorders. The development of this would potentially be assisted by consideration of the White Bear Suppression Inventory (Wegner & Zanakos, 1994). Future studies would also benefit from the use of measures capturing additional aspects potentially relevant to mindfulness and its role in depression such as measures of personality, culture and coping style, as well as levels of stress and anxiety.

5.7 Conclusion

This study provides rich detail about the experience of mindfulness in those with enduring and disabling depression in secondary mental health services. Psychometric analyses of the FFMQ provides substantial support for its internal consistency as well as support for test retest reliability (at six months) and construct validity. Analyses additionally highlight that in those with a substantial level of depression a capacity for a non-judgemental and accepting relationship with negative thoughts and feelings alters unexpectedly, such that it no longer forms an element of mindfulness. This may instead represent an aspect of personality, rumination, thought suppression, self-focused attention or other aspects independent of level of depressive symptomatology or mindfulness. Study findings therefore indicate that a four factor model of mindfulness (excluding Nonjudge), is the most appropriate form of the FFMQ for use in those with moderate to severe, persistent depression. Theme analysis complimented statistical results highlighting marked negative changes in self-judgement and criticism. Quantitative and qualitative findings also

converge on an inverse relationship between mindfulness and depression; the greater the level of depression, the lower the capacity for mindfulness. As captured via theme analysis, participants are able to describe how physically and perceptually withdrawn they become in an attempt to effectively manage their depressive experience. High levels of persistent depression therefore appear to be accompanied by a drive to avoid perceptual contact with experience. However, restricting awareness seems to lead to disconnection from aspects of experience fundamental to participants' sense of pleasure, achievement and self-worth. Whilst this state of reduced awareness is intentionally initiated as a protective strategy against depressive experience, it appears to paradoxically exacerbate this. Future research involving follow-up of participants with substantial levels of depression into remission may shed further light on the role of mindfulness in moderate to severe, persistent depression.

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Appendices

Appendix 1

Dialectical Behaviour Therapy

An early example of the integration of mindfulness into cognitive behaviour therapy was in Marsha Linehan's Dialectical Behaviour Therapy (DBT: Allen & Knight, 2005). This is a manualised therapy drawing from a number of therapy models including CBT and psychodynamic psychotherapy (Linehan, Armstrong, Suarez, Allmon, and Heard, 1991). It was developed for use with people with a diagnosis of borderline personality disorder (BPD), predominantly women (Linehan, 1993), and has been found to effective in reducing problems associated with this disorder such as interpersonal difficulties, suicidal behaviour and hospitalisation (Linehan, Armstrong, Suarez, Allmon, and Heard, 1991, Linehan, Heard, and Armstrong, 1993, Linehan, Tutek, Heard, and Armstrong, 1994). Therapy lasts for up to one year and includes individual and group sessions (Linehan, 1993).

In addition to using a combination of therapy models to treat this population, it incorporates both dialectical thinking and Zen Buddhism as principal components aiming to effect simultaneous acceptance and change (Linehan, 1993, Linehan, 1993, Swales, and Heard, 2009, Palmer, 2002). Dialectical thinking drives change through a process of generating new and potentially helpful perspectives which emerge from in-session exploration of polar opposite ideas. This can lead to the

synthesis of more balanced view points, providing a basis for effective behaviour, reducing the impulsive and often self-destructive actions characterising BPD (Linehan, 1993).

This emphasis on change is supported by the development of a non-judgmental and accepting attitude towards the self and experience, arising from Zen mindfulness practices. Mindfulness is therefore taught as a core skill from the beginning of the programme and remains a focus throughout this. However, DBT differs from many other approaches incorporating mindfulness in that it does not aim to cultivate heightened levels of awareness through extended meditation practices (Swales and Heard, 2009). Instead, it utilises shorter exercises, without emphasis on regular home practice. These exercises aim to assist people in emotionally and intellectually detaching from experience, a position regarded as especially difficult for people with BPD to achieve leading to feelings of being overwhelmed (Palmer, 2002).

Within DBT mindfulness is separated into 'what' and 'how' skills that combined lead to increased levels of awareness. 'What' skills include: observing; describing; participating. 'How' skills include: being non-judgmental; acting effectively and one-mindfully.

Through observing and describing experience, the individual is more attuned to the precise nature of phenomena as it is occurring and able to recognise these as separate and distinct. Detaching in this way from

thoughts and feelings about events facilitates participation in events with full attention to the experience. Mindful participation requires that this is conducted without judging experience or being distracted within it. There is a simultaneous emphasis on actions being effective and helpful, rather than adhering to rigid principles of justice or constructions of 'correct' behaviour (Linehan, 1993).

Heightened levels of mindfulness allows ready access to what is termed 'wise mind', a balanced combination of more usual tendencies to think only emotionally or intellectually. The intentional deployment of wise mind is a target of therapy, leading to skilful action and reduced emotional distress.

In summary, balancing the two apparently paradoxical agents of dialectical change and acceptance is a central feature of DBT (Linehan, and Dexter-Mazza, 2008) and reflects the aim of learning to manage emotional pain effectively, rather than seeking to completely eradicate it (Linehan, 1993). DBT aims to teach and thereby increase levels of mindful awareness for people with BPD in an effort to reduce problems associated with this disorder. Mindfulness within this approach is described as comprising non-judgmental observation and full participation in events as they occur. An ability to describe experience is needed for this and subsequent mindfulness enhances the tendency of the individual to then act in more skilful ways. These changes are associated with clinical improvement.

Although problem behaviours are primarily the focus of therapy, problems with mood including short lived episodes of depression are typical within BPD. Furthermore, baseline affect has a tendency to be extremely negative (Linehan, 1993). An ability to measure the relationship between mindfulness and mood is therefore likely to be of benefit.

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT: Hayes, Strosahl, & Wilson, 1999) is a therapeutic model based within behavioural psychology and relational frame theory. Whilst meditation is not explicitly taught within ACT, mindfulness is nonetheless central to this model, being utilised with acceptance strategies alongside change processes in an effort to increase psychological flexibility (Hayes et al, 2006).

Relational frame theory is a theory of language, proposing that suffering can arise from verbal experiences (Hayes et al, 2011). Difficulty arises because humans are able to conceive of problems verbally and within imagination. Accompanying thoughts, images and words are then experienced as reality. This is termed cognitive fusion and is regarded as leading to undue suffering (Hayes, Strosahl, & Wilson, 1999). Interventions within ACT aim to address this through achievement of what is termed cognitive defusion, a process that appears consistent with

metacognitive awareness: an ability to recognise the self as separate from thoughts and feelings.

Within ACT, a process labelled experiential avoidance is regarded as a key maintaining process in psychological distress (Hayes et al, 2004). Experiential avoidance is employed by the individual as an attempt to resolve emotional difficulty by preventing contact with unpleasant internal experiences. However, this can simply interfere with more helpful responses and processing of difficult thoughts and emotions, leading to further suffering (Hayes et al, 2006). This hypothesis is supported by a reported negative correlation between experiential avoidance and mindfulness (Baer et al, 2008). ACT aims to counteract the tendency of individuals to avoid emotional difficulty through developing a more accepting relationship with distress, whilst committing to changing aspects of behaviour that are aggravating problems and maintaining emotional problems (Hayes, 1999).

The definition of mindfulness within ACT has been described by some as being closest to Buddhist mindfulness of all contemporary definitions, due to its emphasis on individuals becoming aware of and prioritising their life values (Kang & Whittingham, 2010).

In summary, ACT involves assisting cognitive defusion and maintaining contact with unpleasant internal experiences, in turn promoting

acceptance, thereby reducing psychological distress. The deployment of mindfulness is central to this process

Relapse Prevention Therapy

RPT is a form of therapy aiming to assist individuals susceptible to addiction relapse maintain abstinence or moderation (Parks et al, 2001). Rather than the disease model of addiction which conceptualises urges and cravings as resulting from physiological needs triggered by withdrawal, RPT instead theorises that these are driven principally by environmental cues and learned behaviour. Drawn from cognitive behavioural theory of change, interventions aim to assist reduction of addictive behaviours and instead replace them with new ones supporting a reduced alcohol intake (Marlatt & Gordon, 1985). To this end it attempts to increase the individuals sense of self efficacy (Bandura, 1977), through managing difficult situations where risk of relapse is high.

Mindfulness is consequently employed as a facet of this approach, and Vipassana meditation (VM) is taught as a lifestyle modification strategy (Marlatt, 2002). This assists 'urge surfing': the ability to resist the relatively sudden impulse to engage in a pleasurable act (Parks et al, 2001). The main proponent of RPT, Alan Marlatt, increasingly describes using VM with patients with beneficial results (2002). It is hypothesised that increased levels of mindfulness counteracts avoidance behaviours which, though helpful in the short term, are nevertheless associated with addiction relapse over time (Litman et al, 1983, in Breslin et al, 2001).

Attempts to develop heightened levels of mindfulness in people with addiction problems is further supported through findings of a recent study by an author of RPT showing that an increase in mindfulness is correlated with reduced automatic tendency to use alcohol Ostafin & Marlatt, (2008).

Mindfulness-Based Cognitive Therapy

Mindfulness-Based Cognitive Therapy (MBCT: Segal, Williams & Teasdale, 2002) is a group treatment combining mindfulness meditation and cognitive therapy. It was developed for use in recurrent depressive disorder as a treatment

“Specifically designed to address latent vulnerability in depression”

(Barnhofer et al, 2009, p.366).

Borrowing heavily from the MBSR programme, MBCT more precisely focuses on targeting processes described above as central to depressive vulnerability: rumination and self-devaluative thinking patterns triggered by a mild drop in mood (Teasdale et al, 2000).

MBCT involves attentional training through mindfulness meditation. Through this teaching, participants' become more aware of momentary changes in affect, allowing them to intervene at precisely the point at which low mood typically escalates into depressive relapse (Williams,

Teasdale, Segal & Kabat-Zinn, 2007). This is achieved through voluntarily switching modes of mind as conceptualised within the ICS model. MBCT training therefore involves repeatedly practising moving between mindless emoting, conceptualising/doing and mindful experiencing. In this way, the individual becomes directly aware of their tendency to slip into depressive interlock, and become skilled at disrupting this process by accessing a mindful perspective. These steps are hypothesised to reduce the risk of depressive relapse (Segal, Williams & Teasdale, 2002).

This assertion is supported by findings from three randomised controlled trials which demonstrate its effectiveness in reducing the risk of future depressive episodes by approximately 50% for those with a history of three or more episodes of depression, and are therefore particularly susceptible to future relapse (Teasdale et al, 2000, Ma and Teasdale, 2004, Kuyken et al, 2008). It has consequently become a recommended treatment for recurrent depression within the United Kingdom (DH, 2004, 2009).

Whilst these trials have consistently supported the value of MBCT in reducing the risk of depressive relapse in a vulnerable population, the mechanisms by which it achieves its effects remain relatively unexplored. These studies nevertheless appear to support the hypothesis that (for those with multiple episodes) depression is triggered by the gradual development of autonomous processes that involve the reactivation of

depressogenic thinking patterns by dysphoria (Teasdale and Barnard, 1993). MBCT is hypothesised to achieve its effects by disrupting these processes through the development of metacognitive insight and a mindful perspective: the ability to recognise thoughts as mental phenomena, rather than as facts, or 'the truth'. Beckian Cognitive Therapy (CT) is also believed to work due to its disruption of these processes and the subsequent development of metacognitive awareness.

Key features of all mindfulness-based approaches are summarised in the table below:

Mindfulness approaches: summary

Mindfulness-Based Intervention	Philosophical & psychological Framework	Mindfulness Components and Cultivation	Target Population
Mindfulness-Based Stress Reduction	Buddhist philosophy using Vipassana meditation. focuses on 7 core attitudes: patience; compassion; etc	Mindfulness: paying attention on purpose, in the present moment, and nonjudgmentally to things as they are Emphasis on learning meditation exercises and home practice to cultivate mindfulness	Broad range of presentations for general stress to specific physical and psychological health problems
Dialectical Behaviour	CBT and psychodynamic	'What/How' skills of mindfulness. What:	Borderline Personality

Therapy	psychotherapy focuses on dialectical change and acceptance exercises derived from Zen Buddhism	observing; describing; participating. How skills include: being non-judgmental; acting effectively and one-mindfully. involves short meditations - no home practice	Disorder
Acceptance and Commitment Therapy	Behavioural Contextualism Relational Frame Theory Experiential Avoidance Cognitive Fusion	Mindful perspective taught through in-session exercises These develop acceptance of internal experience and lead to cognitive defusion No meditation practices	General psychological and emotional distress
Relapse Prevention Therapy	Buddhist philosophy using Vipassana meditation Cognitive & Behavioural theory of change	Meditation exercises developing ability to resist compulsion to satisfy urges and cravings	People with substance misuse problems
Mindfulness-	Cognitive Therapy	Mindfulness: paying	People with

<p>Based Cognitive Therapy</p>	<p>Vipassana meditation</p> <p>Cultivation of metacognitive awareness</p>	<p>attention on purpose, in the present moment, and nonjudgmentally to things as they are</p> <p>Emphasis on learning meditation exercises and home practice to cultivate mindfulness</p>	<p>remitted recurrent depression</p>
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Appendix 2



Can You Help?

Are you without any mental health disorders?

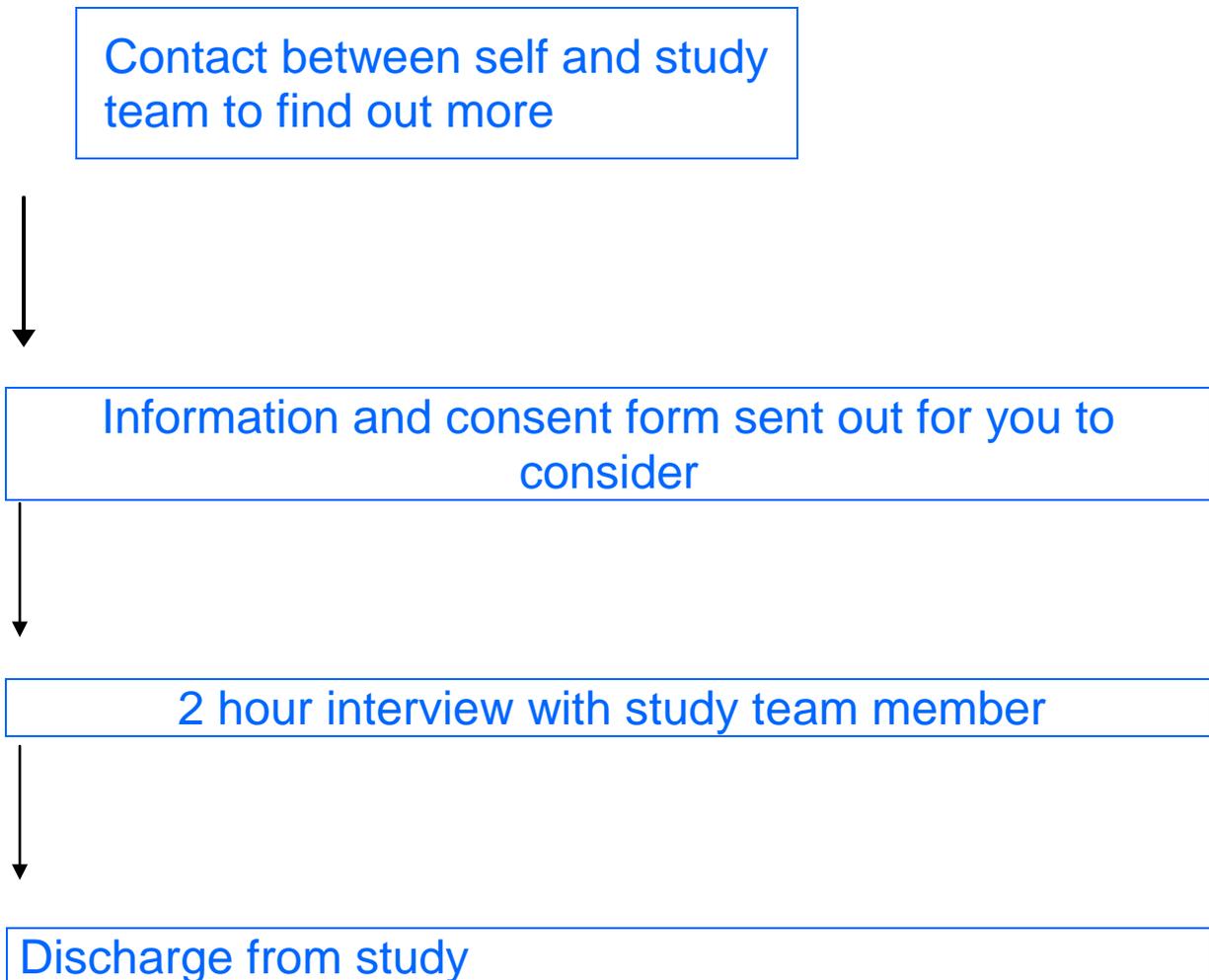
Would you like to take part in a research project exploring the causes of Depression?

If so we would like to hear from you

This project is comparing people with and without depression to identify the role of factors triggering and maintaining depression



Flowchart of Steps within the Study



Who is running this study?

This study is being run by the CLAHRC (Collaboration for Leadership in Applied Health Research and Care). This is a partnership between the University of Nottingham, Nottingham City Council, Nottingham County Council and the local NHS Trusts.

What is this study about?

This study is testing a new way of measuring important features of depression in an effort to more fully understand how this mental health problem works. It is hoped that a deeper understanding of this may contribute to the development of better psychological treatments for this in the future.

What would I need to do?

You will meet with a researcher on one occasion to complete a short interview and some questionnaires. As someone without a current mental health disorder, your results will then be compared to those of a group of people with a diagnosis of depression.

How long does the study last?

Your participation in the study will require a maximum of 2 hours for interview plus time organising this via telephone or email.

What if I decide to take part but then want to leave the study?

You are free to leave the study at any stage and without giving any explanation.

If you are interested in taking part or finding out more, please turn over....

Please help us to understand more about depression

For more information about the study or to apply to take part:

Contact the Research Team for the study;

Anne Garland & Tim Sweeney
Tel: 0115 8440517

Email: tim.sweeney@nottshc.nhs.uk or
anne.garland@nottshc.nhs.uk

Appendix 3

PhD HC Poster V1.0 May 2012



Can You Help?

Are you *without* any mental health disorders?

Would you like to take part in a research project exploring the causes of Depression?

If so we would like to hear from you

This project is comparing people with and without depression to identify the role of factors triggering and maintaining depression

Please Contact:

Tim Sweeney or Anne Garland

Telephone: 0115 8440517

Email: tim.sweeney@nottshc.nhs.uk or anne.garland@nottshc.nhs.uk

Nottingham Psychotherapy Unit, 114 Thorneywood Mount, Nottingham, NG3 2PZ

A partnership of:



The University of
Nottingham

Nottinghamshire Healthcare **NHS**
NHS Trust
Positive about mental health and learning disability

CLAHRC is a member of:



Research making a difference to practice

Appendix 4

HC PIS May 2012 Version 1.0

Participant Information Sheet

Study Title

Mindfulness, Compassion and Depression

Invitation to take part in the study

The researchers carrying out this study are Tim Sweeney and Anne Garland. They are mental health nurses and work for Nottinghamshire Healthcare NHS Trust. Their place of work is Nottingham Psychotherapy Unit, St. Ann's House, 114 Thorneywood Mount, Nottingham, NG3 2PZ.

Before you decide to take part in the research study it is important that you understand why the research is being done and what it will involve.

Please take time to read the following information carefully and discuss it with others if you wish. Please take your time to decide whether or not you wish to take part in the research. Thank you for taking the time to read this.

What is the purpose of the study?

This research is part of a larger study being run by CLAHRC (Collaboration for Leadership and Applied Health Research and Care) in which treatments for depression are being compared to establish which is most effective.

This part of the study aims to understand the role of key factors in the maintenance of depression including the ability to be self-compassionate and self-aware and to do this we need to compare people with and without depression. We are therefore recruiting 30 volunteers who don't have a current diagnosis of depression and invite them to take part in a one-to-one interview to complete a number of questionnaires.

Why have I been approached about this research project?

You are being invited to participate in this study as you don't have a diagnosis of depression.

Do I have to take part?

No, it is up to you whether or not you decide to take part. If you do decide to take part you will be given this information sheet to keep and asked to sign a consent form. If you decide to take part you will be free to withdraw at any time without giving a reason. However, any information that has already been collected from you will not be destroyed and may still be used in the final analysis of the study.

What will happen to me if I take part?

If you decide to take part in this project you will be asked to take part in short interview about your mental health following which you will be asked to complete a number of questionnaires. The interview will take place at a time and place convenient to you. This will be the end of your participation.

Expenses and payments

A thank you gift to the value of £5.00 will be offered to you for taking part

What are the possible advantages and disadvantages of taking part?

Your participation may help further our understanding of depression, potentially leading to improved treatment of this mental health problem.

There is some possibility that talking about your mental health will give rise to feeling sad and upset. At the end of the interview there will be opportunity to discuss this with the interviewer and we will provide the necessary support should the need arise.

What happens if something goes wrong?

If you have any concerns about the study you should speak to the researcher Tim Sweeney or Anne Garland on 0115 8440517 who will do their best to answer your questions.

In the event that something does go wrong and you are harmed during the research, and this is due to someone's negligence, then you may have grounds for a legal action for compensation against the University of Nottingham but you may have to pay your legal costs.

If you wish to make a formal complaint you can do this through the University of Nottingham.

Professor Richard Morriss
University Of Nottingham
CLAHRC-NDL
Sir Colin Campbell Building
Jubilee Campus
Nottingham
NG7 2TU

Will my taking part in the project be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the team will have your name and personal information removed so that you cannot be identified. The only exception to this is if you reveal that you, or anyone else, are at risk of harm because of how you are feeling. In this event, the researcher is obliged to break confidentiality to ensure your/others safety.

In order to analyse the data fully the interview will be audio taped or digitally recorded and then transcribed. Recordings will be held securely in a locked filing cabinet or as a password-protected, access-controlled, computer file. All recordings will be made completely

anonymous so that there will be no indication of who any given quote belongs to. All the recordings will be destroyed once they have been transcribed.

The participant research file will only collect the minimum required information for the purposes of the study and will be held securely in a locked room, cupboard or cabinet. Access to the information will be limited to the research staff and relevant regulatory authorities. Computer held data, including the trial database, will be held securely and will be password protected. All data will be stored on a secure dedicated web server. Access will be restricted by user identifiers and passwords. We will keep your data securely and confidentially for 7 years after the study has finished, in accordance with University of Nottingham regulations. We will only keep your personal contact details until the completion of the study.

Involvement of the General Practitioner/Family doctor (GP)

We will inform your family doctor if any details arise that may be relevant to your medical care.

What will happen to the results of the research study?

The results will be publicised through the extensive arrangements for dissemination locally within the University and the healthcare trust (through road shows, websites and annual conferences). It is also intended that they will be published in peer reviewed journals and disseminated through local, national and international scientific conferences.

Who is organising and funding the research?

This study is part of a larger study which is funded by National Institute for Health Research and matched funding from NHS Trusts, the East Midlands Special Health Authority, the University of Nottingham and two local councils. The chief investigator is based at the University of Nottingham (Professor Richard Morriss) and the principle investigators (Tim Sweeney and Anne Garland) are based at Nottingham Psychotherapy Unit.

Contact details:

Tim Sweeney or Anne Garland
Nottingham Psychotherapy Unit
St. Ann's House
114 Thorneywood Mount
Nottingham
NG3 2PZ

Tel: 0115 844051

Appendix 5

Healthy Controls: Screening Questionnaire

Demographic Information

Name _____ Address _____

Postcode _____

DOB: _____

Telephone Landline _____

Mobile _____

Gender M/F

Marital Status _____ Race/Ethnicity _____

Religion _____ Age Left Education _____

Mental Health Status

"Have you ever had an episode of depression?"

"Have you ever been treated for a mental health problem?"

"Do you think you might have or have had a mental health problem in your life either treated or untreated?"

- *Depression*
- *Anxiety*
- *Panic*
- *OCD*
- *Eating disorder*
- *Major phobias e.g. spiders; dogs; blood; heights; snakes; vomit?*

Appendix 6

Mood Disorder PhD HC Consent May 2012 Version 2.0

PATIENT CONSENT FORM

Title of study: Mood Disorder RCT – An evaluation of the psychometric properties of self-report measures of mindfulness, shame, self-criticism and self-compassion in a depressed population.

REC ref: 09/H0405/42

Name of Chief Investigator: Prof. Richard Morriss

Name of Participant:

Please give your consent to participating in the study by answering the following questions and initialling the boxes.

1. I confirm that I have read and understand the information sheet (V.2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my medical care or legal rights being

affected. I understand that should I withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis

3. I give permission for my interview to be audio taped and understand that this will be destroyed immediately following analysis

4. I understand that relevant data collected during the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have access to my records and to collect, store, analyse and publish (anonymised) information obtained from my participation in the study

5. I agree to my GP being informed if any details arise that may be relevant to my medical care

6. I agree to take part in the above study

Name of participant.....Signature.....Date.....

Name of researcher..... Signature.....Date.....

Copy – 1 for patient, 1 for investigator site file, 1 in patient's research file



Health Research Authority

NRES Committee East Midlands - Derby

Research Ethics Office
The Old Chapel
Royal Standard Place
Nottingham
NG1 6FS

Tel: 0115 8839435
Fax: 0115 8839294

15 June 2012

Professor Richard Morriss
Professor of Psychiatry and Community Mental Health
University of Nottingham
Institute of Mental Health
Triumph Road
Nottingham
NG7 2TU

Dear Professor Morriss

Study title: Randomised controlled trial of the clinical and cost effectiveness of a specialist mood disorders team for refractory unipolar depressive disorder.

REC reference: 09/H0405/42

Protocol number: 09044

Amendment number: 6

Amendment date: 22 May 2012

The above amendment was reviewed on 07 June 2012 by the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Protocol Changes	1.0	10 May 2012
PhD Study Leaflet	1.0	10 May 2012
Patient PhD Invite Letter - TS	1.0	10 May 2012
Patient PhD Invite Letter - AG	1.0	10 May 2012
Advertisement	1.0 (PhD Poster)	10 May 2012
Participant Consent Form: Qualitative TS	1.0	10 May 2012

Participant Information Sheet: HC - TS & AG	1.0	10 May 2012
Protocol	10.0	10 May 2012
Notice of Substantial Amendment (non-CTIMPs)	6	22 May 2012
Covering Letter	E-mail	22 May 2012
Topic Guide - TS	1.0	10 May 2012
Topic Guide - AG	1.0	10 May 2012
Participant Information Sheet: AG Patient	1.1	10 May 2012
Participant Information Sheet: TS Patient	1.0	10 May 2012

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

09/H0405/42:	Please quote this number on all correspondence
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Yours sincerely



Mr Peter Korczak
Chair

E-mail: georgia.copeland@nottspct.nhs.uk

Enclosures: List of names and professions of members who took part in the review

Copy to: Ms Jayne Simpson, Nottinghamshire Healthcare NHS Trust

Ms Sarah Marttunen, University of Nottingham

NRES Committee East Midlands - Derby

Attendance at Sub-Committee of the REC meeting on 07 June 2012

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Mr Peter Korczak (Chair)	Consultant Maxillo-facial Surgeon	Expert
Dr Helen Sammons (Vice Chair)	Associate Professor in Child Health	Expert

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>
Ms Trish Wheat	Co-ordinator

Appendix 8

Interview Schedule

Study title: Mindfulness and Depression

Aim: investigate participant's lived experience of mindfulness and depression

Introduction

Good afternoon. My name is Tim Sweeney Thank you for meeting with me today....

Present the purpose

We're meeting today to explore in some detail your experience of depression. The purpose is to get your perceptions about this, so I am particularly interested in hearing about this in your own words. Your perceptions are what matter. There are no right or wrong, desirable or undesirable answers. I would like you to feel comfortable saying what you really think and how you really feel.

Discuss procedure

I will be taking notes and tape recording the discussion so that I do not miss anything you have to say. I explained these procedures to you when we set up this meeting. As you know everything is confidential. No one will know who said what as any information you provide will be anonymous – nothing you say will be linked to your name.

The discussion will last approximately 60-90 minutes. As you know we will be talking about your experience of depression and this may at times be distressing. If at any point, you would like to take a break or need any support with this, just let me know.

Any questions about this?

Interview

Background information and rapport building

Tell me a little about yourself.....

- *Name, age*
- *Where do you live.....was your journey here ok?*

Research topic (Aim: to explore participant's experience of mindfulness and depression)

Key questions

1. *Please could you tell me about how depression came to be a part of your life?*

Prompts: onset, triggers, life events

2. *Please could tell me what place depression has in your life at the moment?*

Prompts: what happens? How do you feel? How do you cope?

3. *What changes when you become depressed? What alerts you to the fact that you are becoming depressed?*

*Prompts: what do you notice that alerted you to the fact that you've become depressed?
What changes do you notice?*

4. *Please describe how depression impacts upon your life in general*

Prompts: how would you describe the overall effect of depression on your life?

5. *What, if any, impact does depression have on the way you notice things and pay attention to your experiences?*

Prompts: concentration? Engagement in everyday life?

6. *Please describe how depression impacts the way you feel about yourself*

Prompts: does it change your opinion of yourself? In what ways?

7. *When you're feeling depressed, please describe how you spend your time*

Prompts: what do you do? How does this differ compared to when your mood is ok?

8. *How, if at all, does depression affect you ability to function intellectually?*

Prompts: memory, concentration, ability to communicate effectively?

9. *In what way does depression affect the way you react to things?*

Prompts: can you give an example?

10. *Please tell me what is your understanding of the term mindfulness?*

Prompts: are you familiar with this?

11. *How do you experience mindfulness when you are depressed?*

Prompts: what role does it play in your experience of depression?

Summary

(Aim: to round up the interview and close)

Researcher summarise conversation and what has been discussed throughout the interview

Any questions about the interview? Anything else that we haven't discussed today that you feel is important?

I appreciate that talking through these experiences can be upsetting.

Is there anything you would like to discuss in relation to this?

Thanks & close

Appendix 9

Exploring the experience of mindfulness in moderate-severe depression: A thematic analysis – Codebook

MAIN THEME: WITHDRAW

Sub-theme: Behavioural withdrawal

1. *Label:* Behavioural withdrawal
2. *A definition of what the theme concerns:* Reduced contact with people and external environments when mood is depressed
3. *A description of how to know when the theme occurs:* Statements relating to the participant's tendency to isolate themselves from other people and to physically withdraw into their own home/immediate environment
4. *A description of any qualifications or exclusions to the identification of the theme:*
Extracts are excluded that relate to isolation imposed by another, e.g. a controlling partner
5. *Examples, both positive and negative:*

Positive examples:

- I wasn't seeing anyone, I'd lock myself away from everyone I knew. I stopped seeing all my friends and family (pt 7)

Negative examples:

- He [husband] didn't want me to have contact with friends or family (pt 2: reduced contact due to controlling husband rather than in response to depression)

1. **Sub-theme: Reduced awareness**

2. *Label:* Reduced awareness

3. *A definition of what the theme concerns:* A reduced ability to be perceptually aware of internally and externally occurring phenomena

4. *A description of how to know when the theme occurs:* Statements relating to the participants' failure to observe events such as thoughts, feelings, actions, bodily sensations, sights, tastes and interpersonal interactions. Comments illustrate the participants' disconnection from their immediate experience

5. *A description of any qualifications or exclusions to the identification of the theme:*
Extracts are excluded that refer to reduced activity levels rather than reduced awareness

6. *Examples, both positive and negative:*

a. *Positive examples:*

- I can watch the news, the way the air feels. I'll notice the birds singing. I'll notice the difference between ice cream and cake. These are all things that when I'm depressed I don't notice at all. Not for even a second (pt 18)

b. *Negative examples:*

- TS: and when you're doing that, what, if anything might you be less inclined to notice?
PT: well your personal hygiene goes out. Housework, it all stops. It just all becomes enveloping, those feelings, so that there isn't room for anything else (pt 8: pt describes becoming less active due to attention to feelings rather than less aware)

Sub-theme: Deliberate reduction in awareness

1. *Label:* Deliberate reduction in awareness
2. *A definition of what the theme concerns:* Intentional narrowing of attention in order to avoid perceptual contact with unwanted phenomena
3. *A description of how to know when the theme occurs:* Comments will include descriptions of the participants' deliberate attempts to direct awareness away from potentially distressing thoughts and feelings

4. *A description of any qualifications or exclusions to the identification of the theme:*

Sub-theme does not refer to apparently automatic changes in awareness occurring with changes in mood

5. *Examples, both positive and negative:*

a. *Positive examples:*

➤ You're not aware of anything. You don't want to be aware of anything. You just shut the doors, pull the curtains and that's it (pt 4)

b. *Negative examples:*

➤ Unconscious incompetence is probably one of the most comfortable states to be in (pt 12: pt is describing that a lack of awareness is pleasant but not necessarily that it is deliberately sought)

MAIN THEME: THINKING CHANGES

Sub-theme: Ruminating, worrying & relentless thinking

Label: Ruminating, worrying & relentless thinking

1. *A definition of what the theme concerns:* The theme refers to being unable to escape from your thoughts
2. *A description of how to know when the theme occurs:* Participant extracts describe relentless mental activity that can't be controlled. The process of thinking appears autonomous and unwanted
3. *A description of any qualifications or exclusions to the identification of the theme:* Extracts describing perceived causes and consequences of constant thinking are not included
4. *Examples, both positive and negative:*
 - a. *Positive examples:*
 - When I'm depressed I'm more preoccupied. More..... a lot of stuff whirling about in my head (pt 9)
 - b. *Negative examples:*
 - Personally it's what I believe, that my mind is using all its resources to try and get control and resolve things. Because that's what I think ultimately will get me better (pt 5: provides an explanation for the phenomena, rather than describing the phenomena itself)

Sub-theme: Preoccupation with one's thoughts precludes awareness of everything else

1. *Label:* Preoccupation with one's thoughts precludes awareness of everything else
2. *A definition of what the theme concerns:* Attention is absorbed by relentless thinking to the exclusion of everything else
3. *A description of how to know when the theme occurs:* Extracts refer to being unable to focus on anything other than thinking and identify how this impedes awareness of phenomena beyond this, including sensory experiences and events in the environment
4. *A description of any qualifications or exclusions to the identification of the theme:*
Sub-theme does not include examples of reduced motivation or activity resulting from preoccupation with thinking, but refers to reduced awareness arising from this
5. *Examples, both positive and negative:*
 - a. *Positive examples:*
 - I bought some apples the other day. You take a simple apple which I do like. And if my mood is good and I can eat it tasting it and thinking “*yum, yum, this is really nice*”. But if my mood is bad I can sit there and eat the apple and not even know I've eaten it. I've just done it on automatic pilot and I've been thinking of something entirely different (pt 5)

b. Negative examples:

- I was just obsessed and I think I cut out, other than anything connected with ringing up oncology, Macmillan or phoning up whoever I thought would be able to give me any advice or help. Um I didn't really take much interest as I was saying like watching anything, just sitting in front of a screen that's got movement to it. Lost interest in music, lost interest in... Essentially doing anything (pt 16: describes reduced motivation to engage in activities beyond thinking, rather than reduced awareness specifically)

Sub-theme: Changes in cognitive performance

1. *Label:* Changes in cognitive performance
2. *A definition of what the theme concerns:* Reduced ability to think clearly and coherently associated with problems with concentration and memory
3. *A description of how to know when the theme occurs:* Participants' comments focus on reduced memory and inability to concentrate. Descriptions of struggling to organise thoughts in a structured and coherent manner illustrate the changes in this area of functioning since the onset of depression

4. *A description of any qualifications or exclusions to the identification of the theme:*

Extracts describing perceived causes and consequences reduced ability to think clearly are not included

5. *Examples, both positive and negative:*

a. *Positive examples:*

- It made me, like gone completely stupid I felt like. Like my brain wasn't connected. The word you were trying to say wouldn't come from the back of your brain into your mouth (pt 7)

b. *Negative examples:*

- Again the guilt I think I should have.... If I haven't been ill and had the agoraphobia and that I could've done more for her. I didn't really do a lot to help her and I wish I could have. I might spend a fair amount of time thinking about that kind of thing. Maybe it's all that kind of stuff that gets in the way of remembering stuff..... (pt 11: Explanation of what may interfere with thinking rather than description of inability to think itself)

MAIN THEME: SELF-DISLIKE/SELF-CRITICISM

1. *Label:* Self-dislike/self-criticism

2. *A definition of what the theme concerns:* Expressions of negative feelings and thoughts about the self
3. *A description of how to know when the theme occurs:* Descriptions indicative of self-dislike and self-criticism. Comments conveying low self-opinion including words such as “failure”, “worthless” and “useless”.
4. *A description of any qualifications or exclusions to the identification of the theme:*
Comments are excluded that refer to perceptions of negative opinions held by others and comments that may suggest low self-worth, e.g. suicidal thoughts but do not relate these specifically
5. *Examples, both positive and negative:*
 - a. *Positive examples:*
 - I remember one of the recurrent thoughts that still stays with me is that I’m so low I’m crawling on the ground and if I could be lower than a snake on the ground I would be (pt 1)
 - b. *Negative examples:*
 - I felt I was disappointing everyone all the time (pt 7: Refers to disappointing others but not necessarily self-critical about this)

Appendix 10

Qualitative Interview: Tim Sweeney PhD

Research question: "what is the participant's experience of depression?"

21st January 2014: **Participant 4**

Interview took place at the participant's home at 11.00.am. 10 minutes introduction, PIS and signing consent form. Interview lasted 1 hour 1 minute.

TS: it would be helpful if you could give me a rating of your mood out of 10 at the moment. So if 10 were as good as your mood could be and 0 were as bad as it could be, what rating would you give it?

PT: at the moment I'm feeling a little bit.... January so, I'd give it 5 and a half, but I've got the tools hopefully to sort it out. Before Christmas I was working late a bit and stopped on for 3 nights, but what they've done is, the break is normally paid break but I've skipped it and they're saying I haven't. So I've done 10 hours overtime but they've taken 2 off. So, that's got to me a bit.

TS: please tell me what place depression has in your life at the moment?

PT: at the moment, I'd say, I'm maybe teetering on the edge. I hate this time of year. With the work and this, and other bits and bobs, so..... ask me the question again

TS: yes, so what place does depression have in your life at the moment?

PT: what place? Well, I was changing the coil springs on my car on Saturday, and I've been feeling, and I've been feeling as if I really all of a sudden go back down. So really you could say it's about 50/50 at the moment. I'm having more thoughts of "*what the bloody hell am I carrying on for?*" than I have for the past year. But coming back onto how it was at work. Feeling a bit low health wise, the time of year, 50/50 and I'd not having any thoughts at all before, but then I told my wife I was again and she "*oh, don't go down that lane*". And I said "*well I won't go down that lane*", because when I was with the employment worker we had a cognitive, like a therapy thing. And he taught me you have a little man in the back of your head who can tell you "*no, that's wrong, don't do that*" and I've had him out lots of times in the last couple of months. That's one of the tools. And er, that the way it works, talking to it, discussing why you're feeling like this, what we can do about it. And when we're satisfied, put him back, and that's what's helping me at the

moment. Yeah I think without that I would have gone right down. But I'm using that tool and it seems to be positively helping.

TS: can you tell me in your own words about your experience of depression?

PT: I thought about this, this morning and I went right back and I can trace it back to when my eldest boy was a nipper and the first time I was made redundant, because I was off work, knowing that for the 6 months prior to that that things were going bad and that's when it hit me. I think I had a couple of weeks off before I was made redundant, with depression and I reckon that partially one of the times. But,... the rest of my life wasn't exactly fantastic. My mum and dad divorced when I was about 10. My mum brought me and my brother up very strictly. So, the old man used to paste us something rotten. And so, coming back to the depression that first time I can really it, like that. It's from that, well, the redundancy that first time. I think I was out of work about 6 months obviously looking for job when I was depressed..... and moving on a bit I was made redundant again and I had a depression but was straight back into work, and then again later on. I had, a right clinical set to in '96 that lasted about 6 years, and didn't work, tried to commit suicide, so I thought "*oh well.....*" well you know what's it like I just didn't want to go on. Come through that, went through ECT. I don't know. I've lost about 20 years of my life to depression. I really missed my boys growing up from, well the

oldest was about 15 years old, the youngest was 13. He's the one that found me, I was in the back garden. He raised the alarm. But from that age up till the end of that depression, I don't remember much of it to be honest. I don't know how they reacted to it all, I don't even know what they thought about it. But that's what I've done; I've lost 20 years of my life. And then I was getting better working for the NHS, went down again about 8 years ago, but I was working part time NHS. On and off with different medications. Then all of a sudden they changed track "*let's go for a different medication*". Sertraline. I just went right straight off. I'm still on it now. And, it was just like a miracle. They say it's a cliché but it was just like switching a light on. And during that period I was doing CLAHRC as well. From that period up to today, a year and a half, I've been very well apart from these last couple of months where I've been a bit up and down. But, as I say these cognitive tools are very good. If you can understand you're feelings when you start to feel it. Because mine, I don't know whether I've got a strong form of depression, but as soon as it does my mood changes and its rock bottom. But I've got these tools now and they pick me back up again. Um,..... I feel a bit uncomfortable, in my ways... at the moment....

TS: can you say bit more about that? When you say that you're mood is not good what does that experience consist of?

PT: well, I'm just working away at my car, something I enjoy, and then all of a sudden its like a dark cloud comes into your head and its like "*why am I here? What am I doing this for?*" it's a deep, not wanting to be here. It really is a deep .. as if somebody is saying to you "*you don't want to be here*". Someone who's hating you. It makes you feel bad, this idea of what am I doing? It's my grandsons that keep me going, and the wife. So when it starts I just use that tool I've got. Because I think what would they actually think if I did, because the youngest grandson, who's my favourite, I know you shouldn't say that but anyway, he's my blue eyed boy and it would devastate him if anything happened and for the others, the wife. It's such a deep down gnawing sensation in your head, right in your head. It feels like a black cloud and you think "*wow....*"

TS: what changes do you notice when that happens? What else alerts you to the fact that you mood is dropping and that you're depressed?

PT: I start going quiet. I start thinking a lot about how other people perceive me. It doesn't happen so much because I'm on top, but when it comes, it's like what do people think about me, why am I here, do I want to be here? Its just an overwhelming dread of everything. I just don't understand..... You just asked me what the precursor is to it. Its headaches a lot of them. I try and start to think and it just gets worse and worse, and then the old boy at the back of my head says "*why are we here, what are we doing?*".

TS: and what changes in your experience? What do you notice in addition to that about your experience of living when you're depressed?

PT: feelings are you start to feel rotten in the body. You start looking for symptoms. I don't want to commit suicide but you start thinking about ways you could do it. You're looking for a way out of the situation, probably your life. That's the ultimate I s'pose. Do you want to carry on or to..... and when the depression hits, as I say, the headaches get more frequent. I tend to ache in my body I mean its quite physical. But it's been, that upset with the wages the past few days, I'm not doing anything different but I'm just aching in the body. And I think it's been every day just about with it. But I probably find out once I get these headaches and I was talking to the wife in bed last night and I said "*do you know, I've upset myself*" and she said "*yeah, you have haven't you*". So, I'm recognising now what ... I think the precursor is the headaches. If they let go, you take the pills and they go, then its proper headaches if not, it means it's maybe started, and as I say, your body starts to feel rubbish. And then it starts getting darker. Cognitive behaviour is sort of

TS: how do you cope when you're depressed? What do you do to try and cope with it?

PT: well, cognitive behaviour therapy. I get the old boy and we see where we're going wrong. Asking myself am I failing in my work at home and then if I'm not I ask myself why am I feeling like this then? And then try to put it away. I look at negatives and positive and have a conversation with myself about them "*why is that a negative?*" that sort of thing. Why do I have to worry? We've got no real worries, nice house good family. Why should these worries matter to me? I have a conversation about them and ask myself "*what's the problem then?*" And usually there isn't one. That's the way I get myself out of it. Using that tool. I've been to the centre for a course on how to deal with depression and that was excellent. What I picked up from there was that you're supposed to make a record but I'm not a record keeping sort of person. People say "*write it down, write your feelings down straight away*" But I can't be bothered. I'll sort it out. That's what's been going wrong in the past. When I've been feeling it I've had no back up to help me, but I have now. When I start talking about it I start to feel it so its still there..... so I don't talk about it a lot. But as I say everything at the moment is looking positive. I'm working, I've got cash coming in. I'm maybe going abroad for an holiday in the autumn. My youngest son wants to get married there. So it's positive. This is my battle..... (*crying quietly*)

TS: are you ok to carry on, would you like to stop or take a break?

PT: no, no it's fine. You know when you ask me a question, it brings it back and the one person I don't want to hurt is my wife. The last depression I had, she kept me, I didn't have no national insurance, so I got just my stamps, so she took care of me so I don't want to do anything to hurt her..... But she's still with me which I'm surprised about.

TS: I appreciate its bringing these feelings up,

PT: well I don't know what's going on sometimes. I can be watching telly and not know what I'm doing

TS: can you tell me a bit more about that, that experience of watching TV and not knowing?

PT: you're just sitting in your world and nothing matters, nothing.....

TS: and so what are you doing when you're in that place?

PT: well, you're thinking about all the things. About how to get out of it. What people are thinking about you. I never really went out for about 6 years, except in the car. Just to the door. Just trying to make it go away, figure it out. You feel useless like a big lump, just a lump. I used to go into the garage and do my woodwork. It would get me out the way. I was just out the way. I was thinking about "*how can I get cash? I've got none*

how can I get some?" useless..... I just really hated it. It's debilitating. You don't know how you feel... You like when you've got a bad hangover and you feel absolutely down in the dumps, or you've lost somebody *"why did it have to happen to them"* and there's nothing you can do about it. That's, I think that's a good metaphor for it actually, being hung-over, or bereaved, not being able to do anything. I don't want to do this or that, all the questions..... you can't, you're asking yourself questions that you can't answer. That makes you feel worse, you go deeper and deeper and deeper..... And the wife's talking to me and I've got no idea what she's saying. She comes up with little pearls actually *"you remember when..."* well no I don't, because I haven't taken any of it in.. she's talking to me and its just going right over my head.

TS: what accounts for that experience of it going over your head?

PT: I think you just shut off. Mentally, physically. Its as though you shut your ears. You're looking at something but its not there, even though you're looking at it. You could say it's like sitting here with headphones and a blindfold on, just talking to yourself. You're just useless..... all these thoughts all these questions that you can't answer, like, *"where do I get money from? I can't get any.. Well why are you asking that question? Because we need money....."* and she'd sit at the table when the bank statement came, crying her eyes out, and I'd ask *"what can I do?"* But

no, you just can't. It's a never ending battle with yourself with the depression. With your body and your brain and you can't win.

TS: how would you feel about yourself, at these times?

PT: well, like I've explained, useless, and like taking pills that night.

That's it, I'll finish it. Triggered by all the feelings of useless that you're just spare, absolutely spare and as such you feel like, you know, you've

sold the car but you've got a spare part for it that's no good, and that's

how you feel, useless human being. No good to do anything, because you

can't do anything, because once you start something you can't finish it.

Because the other thing is I'm a perfectionist, everything's got to be right.

Like all the faults in the house. To other people they say how nice it is but

to me I can see all the faults in it.

TS: when you're depressed how does it affect how you pay attention to things and what you notice?

PT: there's not a lot that does affect you. You obviously see people

walking past. In your head your thinking "*what are they thinking*". They're

all right what are they thinking? I'm aware or watching people passing,

sitting in this corner and thinking what problems have you got?

TS: are there some things that you would notice more of when your mood is good compared to when it is bad, just in your everyday experience?

PT: well you're lucky because I'm looking at you. You know the psychiatrist, well I saw her for a year and I never know what she looked like because I never made eye contact or looked at her or anyone when I was bad. Sometimes I might be looking round but I'm not noticing anything, unless I notice faults.

TS: could you say a bit more about that state you described of being shut off, and what it is like when your in that state?

PT: it's quite difficult, I'm not very good at expressing feelings, especially when my moods not very good, I can't explain what's going on. Its just one of them feelings, like when I said losing someone you love, or over excessive drinking and you can only cope 50%. You just totally blank everything out, totally useless, don't want to be here

TS: could you describe what you mean by blank everything out?

PT: if you're blanking everything out, you haven't got to feel anything. You're wanting to keep yourself down there, down deep in your head. You want to blank out things you've actually done. Something's in there that wants to switch off. You don't want to know, so my wife tells me stuff and

it's like I'm not there. So I never remember it. If you hear and see things it's a problem, so you don't want to see and hear things, so you just shut yourself off from it, switch it down

TS: what aspects of your experience get switched down?

PT: bad things. But actually not just bad things. Things you're watching the telly. Well everything gets switched off. Like emotions, feelings, sounds. Tell you what you do feel – your body. You feel that, it feels like a tonne weight, that's on your shoulders. That's my experience anyway. Everything felt rubbish, I didn't want to eat either. Socialising with anyone, just my wife but no one else. Sex was out the question. That shut down. Desires, wants, all gone, didn't want nothing. I think I felt that if you eat its spending money we haven't got so I'd save money. But I couldn't take in what my wife was saying "*are you listening to me she'd say?*" I was just in this bubble, nothing mattered. I did listen to classical music a lot though and still do

TS: right

PT: that used to wake me up a bit. It'd mellow things down a bit.

TS: what's your understanding of the term mindfulness?

PT: I don't know..... maybe being aware of what's happening around you. Being knowledgeable about what you're doing and when you're doing it

TS: where did you get that understanding from?

PT: I read a leaflet about it the other day actually as they're running a day at the recovery college and I was thinking I might do it. I can't remember any more about it though. That's another problem of mine. Stuff goes in but I can't get it back out again.

TS: what's your experience of mindfulness when your mood is bad?

PT: well I don't think you're ever mindful when you're like that. You're not aware of anything. Everything is just pointless. You're not aware of anything. You don't want to be aware of anything. You just shut the doors, pull the curtains and that's it. And don't want to be here. And you don't want to be here and that's the bit that's really uncomfortable you just have thoughts that you don't want to be here.

TS: you were saying that when your mood is not good you don't want to be aware. How does that contrast with when your mood is good?

PT: you feel glad to be alive. I want to see my kids growing up, I want a job. I want, not I need. I jump into things a bit more.

TS: does depression affect the way you feel about yourself and treat yourself?

PT: everything is negative. I'm trying but you don't want to, and if you make mistakes you treat yourself rough. Put myself right down. *"You're rubbish. You can't do anything right. What's the point in you being here?"* And cross with myself that I'm the way I am, depressed, useless. I'm not going back to that

TS: is there any difference in your ability to function intellectually when you're depressed?

PT: it's hard. I just can't say how I feel then..... It's difficult to think of anything to say. You shut yourself away, nothing matters so the words aren't there. So like in everyday life you might say *"oh there's a peg on the floor, pick it up"* but when you're depressed you just don't want to know. You've got a lot of conflicting thoughts, feelings, emotions, situations. You just can't deal with any of it. Showering, eating, talking, going to the toilet. You leave it all to the last second, you just can't be bothered. There a lot of total conflictions. *"Useless, you're not a human being. You're just a blob"*.

TS: and thinking about how you react to things when you're mood is not good. Does depression affect the way you react to things at all?

PT: you don't feel anything. You don't react to anything. You're just shut off in your own head. There's nothing you can do about it.

TS: that's all my questions finished now so thank you very much for giving your time for this

Appendix 11

Line	Participant Quotes (Pt 4)	Codes
63	<p>The rest of my life wasn't exactly fantastic. My mum and dad divorced when I was about 10. My mum brought me and my brother up very strictly. So, the old man used to paste us something rotten.</p>	<p>Main code: ORIGINS OF DEPRESSION</p>
71	<p>I had, a right clinical set to in '96 that lasted about 6 years</p>	<p>Main code: EXPERIENCE OF DEPRESSION</p> <p>Long-term depression</p>
75	<p>I've lost about 20 years of my life to depression. I really missed my boys growing up from, well the oldest was about 15 years old, the youngest was 13</p>	<p>Missed much of life due to depression</p>
78	<p>But from that age up till the end of that depression, I don't remember much of it to be honest. I don't know how they reacted to it</p>	<p>Missed much of life due to depression</p>

	<p>all, I don't even know what they thought about it. But that's what I've done; I've lost 20 years of my life</p>	
92	<p>Because mine, I don't know whether I've got a strong form of depression, but as soon as it does my mood changes and its rock bottom</p>	<p>Mood goes down suddenly</p>
112	<p>It's such a deep down gnawing sensation in your head, right in your head. It feels like a black cloud and you think "wow...."</p>	<p>Depression a deep down gnawing sensation in your head</p>
119	<p>I start going quiet. I start thinking a lot about how other people perceive me. It doesn't happen so much because I'm on top, but when it comes, it's like what do people think about me, why am I here, do I want to be here? It's just an overwhelming dread of everything</p>	<p>Onset of depression</p>
352	<p>You've got a lot of conflicting thoughts, feelings, emotions, situations. You just can't deal with any of it</p>	<p>Conflicting experiences and can't deal with it</p>
354	<p>Showering, eating, talking, going to the toilet. You leave it all to the last second, you just</p>	<p>Can't be bothered to do things</p>

	can't be bothered. There a lot of total conflictions	
37	I'm having more thoughts of " <i>what the bloody hell am I carrying on for?</i> "	Main code: SUICIDALITY Why am I carrying on?
72	Tried to commit suicide, so I thought " <i>oh well.....</i> " well you know what's it like I just didn't want to go on	Tried to commit suicide
77	He's the one that found me, I was in the back garden. He raised the alarm	Found by son after suicide attempt
101	Well, I'm just working away at my car, something I enjoy, and then all of a sudden its like a dark cloud comes into your head and its like " <i>why am I here? What am I doing this for?</i> " it's a deep, not wanting to be here. It really is a deep .. as if somebody is saying to you " <i>you don't want to be here</i> ". Someone who's hating you. It makes you feel bad, this idea of what am I doing?	Intense thoughts of not wanting to be here come out of the blue

125	The old boy at the back of my head says “ <i>why are we here, what are we doing?</i> ”	Questioning thoughts of purpose and existence
134	I don’t want to commit suicide but you start thinking about ways you could do it. You’re looking for a way out of the situation, probably your life. That's the ultimate I s’pose. Do you want to carry on or to.....	Not wanting to commit suicide but thoughts about it come into the mind
43	I was with the employment worker we had a cognitive, like a therapy thing. And he taught me you have a little man in the back of your head who can tell you “ <i>no, that's wrong, don't do that</i> ” and I’ve had him out lots of times in the last couple of months. That’s one of the tools	Main code: CBT Using CBT as a tool to help with thoughts/worries
50	I think without that I would have gone right down. But I’m using that tool and it seems to be positively helping	CBT helpful in preventing mood going down
91	As I say these cognitive tools are very good	CBT helpful in preventing mood going down

94	But I've got these tools now and they pick me back up again	CBT helpful in preventing mood going down
154	Cognitive behaviour therapy. I get the old boy and we see where we're going wrong	Use CBT to try and prevent mood going down
161	I have a conversation about them and ask myself " <i>what's the problem then?</i> " And usually there isn't one. That's the way I get myself out of it. Using that tool	CBT helpful in preventing mood going down
123	You just asked me what the precursor is to it. Its headaches a lot of them. I try and start to think and it just gets worse and worse	Main code: PHYSICAL EXPERIENCES OF DEPRESSION Headaches are a precursor Headaches are a precursor First sign is feeling rotten in the body Headaches and aching in the body
145	I think the precursor is the headaches.	
133	Feelings are you start to feel rotten in the body	
137	When the depression hits, as I say, the	

	headaches get more frequent. I tend to ache in my body I mean its quite physical	starts when depression hits
140	I'm not doing anything different but I'm just aching in the body	Aching in the body
291	Tell you what you do feel – your body. You feel that, it feels like a tonne weight, that's on your shoulders	Body gets heavy like a tonne weight
		Main code: POWERLESS
209	there's nothing you can do about it	Powerless to change it
363	There's nothing you can do about it	Powerless to change it
		Main code: MINDFULNESS
308	[mindfulness is] being aware of what's happening around you. Being knowledgeable about what you're doing and when you're doing it	Mindfulness is being aware

		Main code: SHUT AWAY/ABILITY TO PAY ATTENTION EXTERNALLY
188	Well I don't know what's going on sometimes. I can be watching telly and not know what I'm doing	Mind elsewhere
214	The wife's talking to me and I've got no idea what she's saying. She comes up with little pearls actually " <i>you remember when...</i> " well no I don't, because I haven't taken any of it in.. she's talking to me and its just going right over my head	Not taking in information
222	I think you just shut off. Mentally, physically. Its as though you shut your ears. You're looking at something but its not there, even though you're looking at it. You could say it's like sitting here with headphones and a blindfold on, just talking to yourself	Just shut off
273	You just totally blank everything out, totally useless, don't want to be here	Blank everything out completely
278	if you're blanking everything out, you haven't	Blanking everything out protects

	got to feel anything. You're wanting to keep yourself down there, down deep in your head. You want to blank out things you've actually done. Something's in there that wants to switch off	you from bad feelings, memories
282	so my wife tells me stuff and it's like I'm not there. So I never remember it. If you hear and see things it's a problem, so you don't want to see and hear things, so you just shut yourself off from it, switch it down	Blanking everything out protects you
289	TS: What aspects of your experience get switched down? PT: bad things. But actually not just bad things. Things you're watching the telly. Well everything gets switched off. Like emotions, feelings, sounds	Everything gets switched off, not just bad things
297	But I couldn't take in what my wife was saying " <i>are you listening to me she'd say?</i> " I was just in this bubble, nothing mattered	Shut off
321	You're not aware of anything. Everything is	Can't be mindful when depressed

	<p>just pointless. You're not aware of anything.</p> <p>You don't want to be aware of anything. You just shut the doors, pull the curtains and that's it. And don't want to be here. And you don't want to be here and that's the bit that's really uncomfortable you just have thoughts that you don't want to be here</p>	
293	<p>Everything felt rubbish, I didn't want to eat either. Socialising with anyone, just my wife but no one else. Sex was out the question. That shut down. Desires, wants, all gone, didn't want nothing</p>	Everything shut down
349	<p>You shut yourself away, nothing matters so the words aren't there</p>	Shut off
194	<p>You're just sitting in your world and nothing matters, nothing.....</p>	Sitting in your world and nothing matters
362	<p>you don't feel anything. You don't react to anything. You're just shut off in your own head</p>	Shut off
		Main code: TRYING TO

		FIGURE IT OUT
199	Well, you're thinking about all the things. About how to get out of it. What people are thinking about you. I never really went out for about 6 years, except in the car. Just to the door. Just trying to make it go away, figure it out	Trying to figure out the problem
211	You're asking yourself questions that you can't answer. That makes you feel worse, you go deeper and deeper and deeper...	Trying to figure out the problem makes it worse
226	All these thoughts all these questions that you can't answer, like, " <i>where do I get money from? I can't get any.. Well why are you asking that question? Because we need money.....</i> "	Ruminating on unanswerable questions
230	It's a never ending battle with yourself with the depression. With your body and your brain and you can't win	Fight between body and brain
263	Sometimes I might be looking round but I'm not noticing anything, unless I notice faults	Only notice bad things when depressed

	[when depressed]	
202	You feel useless like a big lump, just a lump	Main code: NEGATIVE SELF-OPINION Feel like a useless lump
206	Useless	Useless
225	You're just useless.....	Useless
236	well, like I've explained, useless, and like taking pills that night. That's it, I'll finish it. Triggered by all the feelings of useless that you're just spare, absolutely spare and as such you feel like, you know, you've sold the car but you've got a spare part for it that's no good, and that's how you feel, useless human being. No good to do anything, because you can't do anything, because once you start something you can't finish it	Useless
339	If you make mistakes you treat yourself rough. Put myself right down. <i>"You're rubbish. You can't do anything right. What's the point in you being here?"</i> And cross with	Treating yourself rough – Useless

356	<p>myself that I'm the way I am, depressed, useless</p> <p><i>"Useless, you're not a human being"</i>. You're just a blob</p>	Useless – not a human being
206	You don't know how you feel....	<p>Main code: DON'T KNOW</p> <p>FEELINGS</p> <p>Don't know feelings</p>
357	I just can't say how I feel then..... It's difficult to think of anything to say	Don't know feelings
269	I'm not very good at expressing feelings, especially when my moods not very good, I can't explain what's going on	Can't explain feelings
317	Stuff goes in but I can't get it back out again	<p>Main code: INTELLECTUAL</p> <p>FUNCTIONING</p> <p>Cant access thoughts/memories</p>
		<p>Main code: SUPPORTIVE</p> <p>WIFE & FAMILY</p>

180	The one person I don't want to hurt is my wife. The last depression I had, she kept me, I didn't have no national insurance, so I got just my stamps, so she took care of me so I don't want to do anything to hurt her	Don't want to hurt wife
102	It's my grandsons that keep me going, and the wife	Family keeps me going
111	it would devastate him if anything happened and for the others, the wife	Grandson devastated if anything happened to me
84	Then all of a sudden they changed track " <i>let's go for a different medication</i> ". Sertraline. I just went right straight off. I'm still on it now. And, it was just like a miracle. They say it's a cliché but it was just like switching a light on	<p>Main code: MEDICATION</p> <p>Sudden improvement with medication change</p>

Appendix 12

Mood Disorder PhD TS Patient Consent. May 2012 Version 1.0

PATIENT CONSENT FORM

Title of study: Mood Disorder RCT – An investigation into the role of mindfulness in the maintenance of chronic and recurrent depression

REC ref: 09/H0405/42

Name of Chief Investigator: Prof. Richard Morriss

Name of Participant:

Please give your consent to participating in the study by answering the following questions and initialling the boxes.

1. I confirm that I have read and understand the information sheet (V.1) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my medical care or legal rights being affected. I understand that should I withdraw then the information

collected so far cannot be erased and that this information may still be used in the project analysis

3. I understand that relevant data collected during the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have access to my records and to collect, store, analyse and publish (anonymised) information obtained from my participation in the study.

4. I give permission for my interviews to be audio taped and transcribed. I understand that any quotes will be anonymous and I will not be identified

5. I agree to my GP being informed if any details arise that may be relevant to my medical care

6. I agree to take part in the above study

Name of

participant.....Signature.....Date.....

Name of researcher: **Tim Sweeney** Signature.....Date.....

Copy – 1 for patient, 1 for investigator site file, 1 in patient's research file

Appendix 13

TS Patient PIS May 2012 Version 1.0

Participant Information Sheet

Study Title

Mindfulness and Depression

Invitation to take part in the study

The researcher carrying out this study is Tim Sweeney. He is a mental health nurse by profession and works for Nottinghamshire Healthcare NHS Trust. Tim is employed as a cognitive behavioural psychotherapist and his place of work is Nottingham Psychotherapy Unit, St. Ann's House, 114 Thorneywood Mount, Nottingham, NG3 2PZ.

Before you decide to take part in the research study it is important that you understand why the research is being done and what it will involve.

Please take time to read the following information carefully and discuss it with others if you wish. Please take your time to decide whether or not you wish to take part in the research.

Thank you for taking the time to read this.

What is the purpose of the study?

The aim of this study is to recruit 20 people from the CLAHRC depression research project and invite them to take part in a one to one semi-structured interview to try and examine in greater depth their experience of depression and how this has influenced the person's everyday life.

Why have I been approached about this research project?

You have been approached because you are already a participant in the CLAHRC-NDL depression research project. This project being carried out by Tim Sweeney is part of the CLAHRC depression project and is part of a programme of study for his PhD.

Do I have to take part?

No, it is up to you whether or not you decide to take part. If you do decide to take part you will be given this information sheet to keep and asked to sign a consent form. If you decide to take part you will be free to withdraw at any time without giving a reason. A decision to take part, not take part or withdraw at any time will not affect the care and treatment you receive from Nottinghamshire Healthcare NHS Trust in any way. However, the information that has already been collected from you will not be destroyed and may still be used in the final analysis of the study.

What will happen to me if I take part?

If you decide to take part in this project you will be asked, on one occasion only, to take part in a 2 hour interview. The interview will take place at a time and place convenient to you. During the interview you will be invited through a process of questions and discussion to share your experiences, opinions and beliefs about depression. It is hoped that the information we gather will help researchers understand more fully the role of key factors believed to be responsible for maintaining episodes of. From this it is hoped we could develop and refine more effective psychological treatments to help people tackle their depression.

With your permission the interview will be audio recorded. The purpose of the recording is to ensure the information gathered in the interview is accurate and used to verify any written notes and identify common themes in the research.

Expenses and payments

A thank you gift to the value of £5.00 will be offered to you for taking part

What are the possible advantages and disadvantages of taking part?

Your participation may help further our understanding of depression, potentially leading to improved treatment of this mental health problem.

There is some possibility that sharing your experiences of depression will give rise to feeling sad and upset. At the end of the interview there will be opportunity to discuss this with the interviewer and we will provide the necessary support should the need arise.

What happens if something goes wrong?

If you have any concerns about the study you should speak to the researcher Tim Sweeney on 0115 8440517 who will do his best to answer your questions.

In the event that something does go wrong and you are harmed during the research, and this is due to someone's negligence, then you may have grounds for a legal action for compensation against the University of Nottingham but you may have to pay your legal costs.

If you wish to make a formal complaint you can do this through the NHS complaints procedure. Details can be obtained through your GP surgery.

Will my taking part in the project be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential, and any information about you which leaves the team will have your name and personal information removed so that you cannot be identified. The only exception to this is if you reveal that you, or anyone else, are at risk of harm because of how you are feeling. In this event, the researcher is obliged to break confidentiality to ensure your/others safety.

In order to analyse the data fully the interview will be audio taped or digitally recorded and then transcribed. Recordings will be held securely in a locked filing cabinet or as a password-protected, access-controlled, computer file. All recordings will be made completely anonymous so that there will be no indication of who any given quote belongs to. All the recordings will be destroyed once they have been transcribed.

The participant research file will only collect the minimum required information for the purposes of the study and will be held securely in a locked room, cupboard or cabinet. Access to the information will be limited to the research staff and relevant regulatory authorities. Computer held data, including the trial database, will be held securely and will be password protected. All data will be stored on a secure dedicated web server. Access will be restricted by user identifiers and passwords. We will keep your data securely and confidentially for 7 years after the study has finished, in accordance with University of Nottingham regulations. We will only keep your personal contact details until the completion of the study.

Involvement of the General Practitioner/Family doctor (GP)

We will inform your family doctor if any details arise that may be relevant to your medical care.

What will happen to the results of the research study?

The results will be publicised through the extensive arrangements for dissemination locally within the University and the healthcare trust (through road shows, websites and annual conferences). It is also intended that they will be published in peer reviewed journals and disseminated through local, national and international scientific conferences.

Who is organising and funding the research?

This study is part of a larger study which is funded by National Institute for Health Research and matched funding from NHS Trusts, the East Midlands Special Health Authority, the University of Nottingham and two local councils. The chief investigator is based at the

University of Nottingham (Professor Richard Morriss) and the principle investigator (Tim Sweeney) is based at Nottingham Psychotherapy Unit.

Contact details:

Tim Sweeney

Nottingham Psychotherapy Unit

St. Ann's House

114 Thorneywood Mount

Nottingham, NG3 2PZ

Tel: 0115 8440517

Appendix 14

Protocol changes

These amendments are part of two Phd theses undertaken as part of the CLAHRC depression project

Description of what we are going to do:

First amendment

- Recruit 30 non-depressed controls as participants demographically matched for the depressed sample recruited to the CLAHRC Mood Disorder RCT (REC ref: 09/H0405/42)
- Administer a sub-set of measures used within the RCT as follows:
 1. Hamilton Rating Scale for Depression (HRSD)
 2. Beck Depression Inventory (BDI)
 3. Structured Clinical Interview for DSM-Diagnosis (SCID)
 4. The forms of self-criticising/attacking/self-reassuring scale
 5. How I typically act towards myself in difficult times
 6. Others as shamer scale
 7. Five Facets of Mindfulness Questionnaire
 8. AAQ 22 item version
 9. Rumination scale
- Conduct a one off interview lasting a maximum of two hours
- Offer a small token remuneration of a £5.00 voucher
- Recruited via a flyer placed on University of Nottingham and Nottinghamshire Healthcare NHS staff notice boards
- Two researchers conducting the interviews Tim Sweeney and Anne Garland
- The Purpose is to compare scores on the above questionnaires between a population of depressed participants and a group of non-depressed participant controls to test the validity and reliability of questionnaires 4-9 in measuring what they purport to measure and to use the data collected from questionnaires 4-9 correlated with measures of depression (questionnaires 1-3) to model variance in depression in a clinical population of participants experiencing chronic and recurrent depression.

Second amendment

- Two researchers (Tim Sweeney and Anne Garland) through purposive sampling will interview up to 25 participants each already recruited to the CLAHRC depression project drawn from both the treatment and control arms of the trial.
- The interviews are qualitative semi-structured interviews using Interpretative Phenomenological Analysis methodology and Thematic Analysis to explore participants lived experience of mindfulness, shame, self-criticism and self-compassion.
- Each interview will last a maximum of two hours
- Interviews will be recorded and transcribed

Appendix 15

Ethics response – why further burden on CLAHRC patients?

The proposed amendment relates to the introduction of qualitative interviews for 20 participants for a maximum of two hours.

Qualitative methods, involving analysis of participants lived experience, will be used in this study in an attempt to gain information more precisely about the role of mindfulness in depression, and to examine the ability of the FFMQ to accurately capture the process of mindfulness in this population.

Qualitative interviews alongside quantitative methods will enable a more integrated definition of mindfulness that potentially more accurately reflects this construct and its role in influencing depression.

The need for psychometrically sound measures of mindfulness has been consistently observed within literature relating to mindfulness in order to more fully understand the construct. The psychometric properties of the FFMQ have not been tested on people with chronic and severe depression, a population that mindfulness interventions are increasingly being used with.

Mechanisms through which MBCT achieves its beneficial effects are unclear. It is primarily recommended for people with recurrent depressive disorder, yet no measures of mindfulness have established psychometric properties with this population and there are no studies exploring this construct using qualitative means, except in participants who have undergone mindfulness training. This limits understanding of mechanisms of action and the role of mindfulness in influencing recovery from depression. A study clarifying this issue would be advantageous in many ways. For example:

- A more precise understanding of the mechanisms driving this problem is necessary in order to accurately target these and alleviate the suffering associated with this disorder. A measure of mindfulness that reliably and accurately captures this construct and its role in depressive disorder may clarify whether this is indeed the mechanism through which recovery appears to be mediated as hypothesised.
- Focusing on the role of mindfulness in depressive disorder is further supported through the inclusion of Mindfulness-Based Cognitive Therapy within UK health guidelines specifically for recurrent depressive disorder (DoH, 2004; 2009). This intervention is consequently being increasingly used within health services for people with this disorder. The absence of a measurement of mindfulness whose psychometric properties have been rigorously tested with this population weakens any assertion that mindfulness is responsible for improvements in depressive disorder. Therefore, the psychometric properties of a mindfulness measure would need to be established with a depressed population to minimise the risk of research into this area producing spurious results. The qualitative interviews proposed in the amendment will assist this process.

- A more accurate understanding of the role of mindfulness in depression can assist development of more effective and targeted treatments for this disorder.

In summary, integration of quantitative and qualitative findings will provide more comprehensive information about the role of mindfulness in depression than either method alone can achieve. This understanding may contribute to more effective and targeted treatments for this disorder in the future.

Appendix 16

Correlation Matrix: Testing for significant differences between correlations in relation to the study's primary hypotheses

	HAMD&D -0.27	HAMD&NJ 0.03	HAMD&NR -0.2	HAMD&AA -0.3	HAMD&Total -0.29	BDI&O -0.19	BDI&D -0.3	BDI&NJ -0.05	BDI&NR -0.29	BDI&AA -0.39	BDI&Total -0.39
HAMD&O -0.1	0.112318	0.005361	0.467177	0.06008	0.074717	0.407	0.06008	0.64921	0.074717	0.005216	0.005216
HAMD&D -0.27		0.005361	0.020188	0.77186	0.847106	0.449759	0.77186	0.040652	0.847106	0.233508	0.233508
HAMD&NJ 0.03	0.005361		0.65059	0.586711	0.002865	0.043768	0.00206	0.468353	0.002865	0.00006	0.00006
HAMD&NR -0.2	0.507694	0.034795		0.340657	0.392252	0.925702	0.340657	0.167824	0.392252	0.063229	0.063229
HAMD&AA -0.3	0.77186	0.00206	0.008851		0.922635	0.295385		0.019237	0.922635	0.367762	0.367762
HAMD&Total -0.29	0.847106	0.002865	0.011774	0.01524		0.342618	0.01524	0.024937		0.318281	0.318281
BDI&O -0.19	0.449759	0.043768	0.118979	0.295385	0.342618		0.295385	0.198621	0.342618	0.05097	0.05097
BDI&D -0.3	0.77186	0.00206	0.008851		0.922635	0.295385		0.019237	0.922635	0.367762	0.367762
BDI&NJ -0.05	0.040652	0.468353	0.167824	0.019237	0.024937	0.024937	0.019237		0.019237	0.001114	0.001114
BDI&NR -0.29	0.847106	0.002865	0.392252	0.922635		0.342618	0.01524	0.024937		0.318281	0.318281
BDI&AA -0.39	0.233508	0.00006	0.063229	0.367762	0.318281	0.05097	0.367762	0.001114	0.318281		
BDI&Total -0.39	0.233508	0.00006	0.063229	0.367762	0.318281	0.05097	0.367762	0.001114	0.318281		

*The columns and row headings indicate the correlation between FFMQ facets and the HAMD and BDI.

Figures in italics represent correlation coefficients indicating whether the correlations between FFMQ facets and the HAMD/BDI are significantly different from one another. Figures in **bold highlight significant differences between correlations.

***Abbreviations: HAMD=Hamilton Rating Scale for Depression; BDI=Beck Depression Inventory; O=FFMQ Facet Observe; D=FFMQ Facet Describe; NJ=FFMQ Facet Nonjudge; NR=FFMQ Facet Nonreact; AA=FFMQ Facet Actaware; Total=FFMQ Total