

**Investigation of the relationship
between depression, rumination,
metacognitive beliefs
and cognitive fusion**

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Lastly, it seems fitting to dedicate this to ‘the bump’ who has, at least in the final stages, been along for the ride.

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ABSTRACT

Background

It has been found that both depressed patients and patients who have recovered from depression report more rumination and hold more meta-cognitive beliefs about the benefits of rumination than never-depressed controls. Furthermore, it is suggested that a ruminative cognitive style predicts the onset, length and severity of depressive episodes. Within an ACT (Acceptance and Commitment Therapy) perspective on depression, it is suggested that rumination in depression is a verbal reason-giving behaviour used to 'solve' the problem of depressed mood. However, it is proposed that an individual's fusion with these verbal reasons (i.e. cognitive fusion) perpetuates rumination and impedes the adoption of more functional behaviours.

The aim of this study is to investigate the relationships between depression, rumination, cognitive fusion and positive beliefs about rumination.

Method

A between-groups design was used comparing currently depressed adults ($n = 26$), recovered depressed adults ($n = 21$) and never depressed adults ($n = 27$) on a battery of self-report measures for depressive symptomatology, rumination, positive beliefs about rumination and cognitive fusion. Data were analysed using ANOVAs, *post hoc* comparisons, and path analysis: an extension of multiple regression.

Results

Significant differences were found in rumination and cognitive fusion between all three groups, with higher levels of rumination and cognitive fusion found in both the currently depressed and recovered depressed groups compared to never depressed controls. Significant differences in positive beliefs about rumination were found only between the currently depressed group and the never depressed group. Results also indicated that depression severity was best predicted by rumination and cognitive fusion rather than positive beliefs about rumination. Furthermore, the

relationships between the variables of cognitive fusion and rumination ($\beta = 0.76, p < .001$), and cognitive fusion and depression ($\beta = 0.66, p < .001$), were stronger than the relationships between any of the other variables included in this study.

Discussion

Overall, the findings support the suggestion that cognitive fusion be considered in the conceptualisation of ruminative processes and depression. The results suggest that in individuals who have recovered from depression and are no longer clinically depressed, a difference in cognitive processes such as rumination and cognitive fusion remains. This may indicate that cognitive fusion is not secondary to depression and does appear to be implicated in the ruminative process.

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Chapter 1: Introduction

Within this chapter, depression, rumination, and the relationship between them, will be explored. A variety of theoretical models for these processes will be introduced and revisited throughout the introduction, with reference made to their clinical application. Within this exploration, particular focus will be given to two specific psychological treatments for depression and the theoretical models underpinning them: metacognitive therapy (MCT; Wells, 1995) which is underpinned by the self-regulatory executive function model (S-REF; Wells & Matthews, 1994, 1996), and acceptance and commitment therapy (ACT; Hayes *et al.*, 1999) which is underpinned by relational frame theory (RFT; Hayes *et al.*, 2001). Cognitive processes which are proposed by these models to be implicated in depression and rumination will also be introduced. In particular, the roles of metacognitive beliefs and cognitive fusion will be explored. In each revisitation of the theoretical models and these cognitive processes, the implications on our understanding of the relationship between rumination and depression will be explored in further depth, and this will lead toward the concluding rationale for the current empirical study.

1.1 Depression

‘Depression’ is a term which covers a wide range of mood disorders and, as such, variations in the definition of depression can lead to confusion when applying research findings to clinical practice. It is therefore imperative to have a clear

conceptualisation of the specific disorder being investigated at the outset. This will now be explored further.

1.1.1 Definition of depression

The term ‘depression’ with regard to mood or emotional state is reported to have appeared as early as 1665, when it meant a general lowering of mood or spirits (Kanter *et al.*, 2008). However, over time the term depression has come to be used to describe a specific psychological disorder. According to the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revisions (DSM-IV-TR; APA, 2000) mood disorders can be separated into two main categories, Depressive Disorders, i.e. unipolar depression, and Bipolar Disorders. Within the category of Depressive Disorders further distinctions are made, and separate classifications for Major Depressive Disorder, Dysthymic Disorder, and Depressive Disorder Not Otherwise Specified are included. The term ‘Major Depressive Disorder’ was first selected by the American Psychiatric Association for a particular cluster of symptoms in the 1980 Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) and has since become widely used. As with historical definitions of ‘depression’, lowered affect or dysphoria remains the primary feature of Major Depressive Disorder (MDD). However, a range of additional possible symptoms are also included, such as sleep and appetite changes, loss of interest in activities (anhedonia), fatigue, restlessness, concentration problems, feelings of guilt and hopelessness, and suicidal ideation. MDD is indicated if at least five of a possible

nine symptoms is reported to be present over a minimum of a two week period, and at least one of the symptoms experienced is depressed mood or anhedonia most of the day, nearly every day, over that time-frame. MDD is *not* indicated if the symptoms are due to a recent bereavement or are the result of the physiological effects of substance use or another general medical condition.

MDD is estimated to be the most common depressive diagnosis in terms of lifetime prevalence rates (Kessler *et al.*, 1994) and the lifetime risk of suicide in those experiencing MDD has been suggested to be as high as 6 per cent, compared to 1.3 per cent in the general population (Inskip *et al.*, 1998). However, it is acknowledged that the diagnosis of Depressive Disorder simply represents a convenient grouping of a cluster of symptoms (somatic, emotional, cognitive and behavioural) and the presence and nature of these symptoms varies considerably across people with the same diagnosis (Lindal & Steffanson, 1991). With the parsing of Depressive Disorder into several categories, such as MDD, a medical model may consider there to be potentially different aetiologies and treatment implications for each. However, from a behaviour-analytic perspective, depression is seen not as several distinct disorders, nor as a syndrome, but as a phenomenon of chronic experience of sadness which varies greatly in time course and has several associated symptoms which also vary considerably in their severity and impact for different individuals (Kanter *et al.*, 2008). Although for the purpose of this study the specific diagnostic category of MDD (single episode or recurrent) has been used to screen for eligibility of participants into the ‘currently depressed’ and ‘recovered depressed’ groups, this was simply as a means of ensuring the samples were representative of those typically

seen within a clinical setting and to communicate clearly the type of symptoms experienced by those participants.

1.1.2 Prevalence of depression

The magnitude of the rates of depression has been well reported over recent years. For example, recent epidemiological data from across six European countries found that almost 7 per cent of the population report experiencing major depression over the past six months (Lepine *et al.*, 1997). Furthermore, over the course of their lifetime, it is predicted that more than 15 per cent of the general population will experience an episode of depression (National Collaborating Centre for Mental Health, 2010). Indeed, the prevalence of depression is such that it has been referred to as the “common cold” of outpatient populations, with approximately one in four women and one in ten men seeking treatment for depression at some point in their lives (Kanter *et al.*, 2008). However, it is known that people who are experiencing depression, like others with mental health difficulties, are reluctant to seek treatment. Only just over half will seek treatment for their depression symptoms, with the majority doing so from their primary care physician (Kessler *et al.*, 1994). Yet even with this low proportion seeking treatment, depression remains the third most common reason cited for consultation in general practice in the UK (National Collaborating Centre for Mental Health, 2010). Depression therefore represents a significant issue for the National Health Service and it is predicted this will not ease in future decades. Indeed, it is estimated by the World Health Organisation that by

2030 depression will be the second leading cause of disease burden worldwide, following HIV (Mathers & Loncar, 2005). Unsurprisingly, depression has been the focus of much research activity over the past decades and issues of recurrence within depression and of treatment resistance have been highlighted.

1.1.3 Recovery and relapse

It is known that in terms of the average duration of episodes of depression, there is great variability. However, it is broadly reported that approximately 25 per cent of episodes of major depression are recovered within one month, 50 per cent recover within three months, 15 to 39 per cent are still depressed one year from symptom onset and 22 per cent of cases remain depressed at two years (Williams, 1997).

Furthermore, even after *multiple* treatment interventions, as many as 10 per cent of depressed patients remain depressed (Amsterdam *et al.*, 2001). It is also known that of those that recover from an episode of depression, 50 to 75 per cent will experience another episode within two years (Williams, 1997) and for those with a history of two or more episodes this risk is increased to 70 to 80 per cent (Consensus Development Panel, 1985). Evidently then, depression is experienced as a chronic relapsing condition.

Although a wealth of treatments for depression exists, there clearly remains scope for improving treatment outcomes. A recent meta-analysis (de Maat *et al.*, 2006) looked at 10 treatment outcome studies and found equivalent remission rates for antidepressant medication and psychotherapy of around 37 per cent. However, at

follow up, relapse rates for those treated with antidepressant medication was 57 per cent and for those treated with psychotherapy was 24 per cent. These findings suggest that although psychotherapy may sometimes contribute to a form of protection against recurrence and relapse for depression, for the majority of people treated this is not the case: most do not recover and, of those who do, a significant proportion relapse. This finding is significant. As well as the personal burden to individuals, this also has clear implications for the social and economic burden imposed by depression.

Theories regarding the onset and chronic relapsing condition of depressive disorders have been developed from cognitive, behavioural and neurobiological perspectives. In accordance, treatment approaches to depression have varied in both their underlying theoretical model and mode of delivery. An exploration of some of the broad historical developments in the treatment of depression follows.

1.1.4 Historical developments in the treatment of depression

Treatments for depression have evolved through the ages, often informed by the prevalent understanding of the aetiology of depression at the time. In early ancient Greek and Roman accounts of depression, the term ‘melancholia’ was used, with explanations for its development ranging from physical explanations, such as Hippocrates account of excess levels of black bile in the spleen, to psychological explanations such as Cicero’s suggestion that violent rage, fear and grief cause melancholia. The expansion of both these biological and psychological models of

depression has evolved over the centuries, eventually leading to the prevalent treatment models of more recent years.

Pharmacological treatment

Since the 1950s there has been a proliferation of the biological model of depression, in which it is hypothesised that depression is caused by chemical imbalance of brain neurotransmitters. This medical model of depression has supported the development and promotion of pharmacotherapy in the treatment of depression, in particular of developments in antidepressant medication. Antidepressants are normally recommended in first-line treatment of patients whose depression is of at least moderate severity (National Collaborating Centre for Mental Health, 2010). It is reported that the prescription of antidepressants has been rising over the past two decades, with 3.53 million prescriptions being dispensed in Scotland in 2006, as compared to 1.16 million being dispensed in 1992 (Information Services Division Scotland, 2009). However, as discussed previously, although beneficial for many, outcome studies suggest pharmacological treatment is not always effective in treating depression in the longer-term and alternative treatments are required.

Psychological treatment

Parallel to the development of the biological model, a broad range of psychological treatments for psychopathology have been developed over the years, each with differing theoretical backgrounds and implications in the treatment of depression. At the turn of the twentieth century, psychoanalysis was relatively dominant and was only gradually challenged by behaviourism and then, from about the 1970s onwards,

by humanistic and cognitive therapies (Feltham, 2007). The growth in different treatment models has since escalated and it has been calculated that towards the end of the twentieth century over 400 named therapeutic approaches existed (Feltham, 1997). However, within this vast number, several therapies have stemmed from the two broad strands of cognitive therapy and behaviourism. Aspects of these models have been frequently revised, developed and at times merged, in an attempt to gain greater understanding of psychopathology and psychological processes. Indeed the processes explored within this study (rumination, metacognition and cognitive fusion) all fall broadly within these two strands. In order to provide a context for exploring the links between these processes, a brief summary of the treatment models from which they stem follows.

1.1.5 Treatment models

1.1.5.1 Cognitive Therapies

Cognitive processes became increasingly explored in the mid twentieth century and cognitive theory began to separate away from Skinnerian and Pavlovian learning theory by focusing on the mental processes which intervene between stimulus and response. For example, Mahoney explored the role of cognitive processes such as expectation and attribution in conditioning (Mahoney and Arnkoff, 1978). Various cognitive-behavioural therapies were developed in response to this shift in emphasis on the role of cognitive processes. One example is Ellis's rational emotive therapy (Ellis, 1962), now known as rational emotive behaviour therapy (REBT), in which

emotional disturbance is argued to derive from underlying evaluative ‘irrational’ beliefs. Ellis’ theory was based on the philosophical branch of Stoicism in which it was proposed that peace of mind comes from acceptance of realism. Within REBT it is philosophical change which is aimed for, through the targeting of these underlying irrational beliefs. Similarities with Beck’s cognitive therapy are apparent. However, rather than deriving from a philosophical stance, Beck developed his model from research he carried out into depression. This, and subsequent research, established the presence of negative cognitive content during depressive episodes, leading cognitive researchers to assume a causal role for cognition in depression (Clark *et al.*, 1999). Furthermore, according to this cognitive theory, individuals who hold negative self-schemas (i.e. negative beliefs about the self, the world and the future) when otherwise well, are more likely to develop depression in the future (Beck, 1967). Beck’s cognitive behavioural therapy (CBT), as it is now known, involves addressing this ‘thought disorder’ through processes of distancing, reframing and de-centring (Beck, 2005). This entails identifying problematic cognitions (also known as negative thoughts), weighing up evidence to evaluate the validity of their content (distancing), altering these thoughts to make them more ‘reality-based’ (reframing, which is also known as cognitive restructuring) and thus de-emphasising meanings of the thoughts and reorienting patterns of thinking (de-centring). It should be noted, however, that although similarities between REBT and CBT are apparent, proponents of REBT would argue that a fundamental difference lies in REBT’s aim not to try to change the actual inferences that individual’s make, but try to change the process by which they evaluate these inferences. In other words, cognitive restructuring or reframing is not used but de-centring is still a therapeutic goal.

1.1.5.2 Metacognitive Therapy (MCT)

A more recent development within the cognitive branch is metacognitive therapy (MCT; Wells, 1995). Similar to REBT, it is this contrast between the principle focus on mental processes as opposed to mental content which underscores MCT. Within MCT it is proposed that emotional disorder is caused by the way thinking processes are controlled and the style they take, such as worry and rumination.

Wells (2008) goes on to highlight the difference with traditional CBT: ‘Content *is* important in MCT, but it is the content of metacognition rather than the content of cognition that counts.’(p.651). ‘Metacognition’ refers to the stored content of beliefs about cognition, to cognitive processes in terms of evaluations of (and attributions about) processes and mental phenomenon, and also to implicit rules of what to do in response to certain cognitive events.

MCT derives from the Self-Regulatory Executive Function Model (S-REF: Wells & Matthews, 1994) in which it proposes that a thinking style known as the Cognitive Attentional System (CAS) is a universal feature of disorder and is responsible for prolonging and intensifying distressing emotions. This consists of repetitive thinking in the form of worry and rumination, which is used as a means of coping with threat. It also consists of an attentional strategy in which sources of threat (which are often internal e.g. thoughts and feelings) are focussed on excessively. Also implicated are unhelpful coping behaviours, such as avoidance, which prevent the testing out of faulty beliefs. Within the S-REF model, the CAS is the result of metacognitive beliefs which control thinking processes. An example of such metacognition would be positive beliefs about the process of rumination, such as “ruminating about my

depression helps me to understand past mistakes and failures”. A more detailed summary of the S-REF model and its account of rumination is provided in section 1.2.5.5.

In terms of therapeutic techniques, MCT incorporates attention training designed to reduce perseveration (i.e. worry or rumination), increase flexibility in the control of attention and thinking processes, and promote metacognitive awareness. However, because it was found that this procedure was not sufficient in reducing rumination additional techniques were included specifically for the treatment of depression (Papageorgiou & Wells, 2000). These techniques were intended to increase adherence with attention training and focussed on directly modifying erroneous metacognitive beliefs which, according to the S-REF model, drive the ruminative response. This process of modifying underlying metacognitive beliefs is carried out by training patients first to identify their own rumination and threat monitoring, then challenge any negative metacognitive beliefs they hold about the uncontrollability and significance of depressive thoughts and feelings, and challenge any positive metacognitive beliefs they hold about the utility of ruminating and engaging in threat monitoring as a means of coping (Wells *et al.*, 2009). Again this therapeutic technique is similar to the distancing and reframing techniques of traditional CBT, although the focus is on the identification and reframing of metacognitions rather than cognitions. Within this model, it is believed that by updating the metacognitive content that controls and directs automatic processes, it will lead to less of such processes (such as thought intrusion and rumination). The role of metacognition in relation to rumination and depression is explored more fully in section 1.3.

1.1.5.3 Acceptance and mindfulness based therapies

Acceptance and mindfulness branches of psychological therapy, sometimes known as ‘third wave’ therapies (Hayes, 2004), have argued that the traditional clinical cognitive model is flawed. In particular, the cognitive primacy theory which states that cognitions need to be challenged and reframed in order for change to occur has been criticised. For example, Longmore & Worrell (2007) suggest that the hypothesis is not well accounted for, and cognitions change when a person recovers from their mood disorder regardless of whether the treatment method used directly addresses cognitions (e.g. Rehm *et al.*, 1987; Imber *et al.*, 1990). This finding has been extended to schemata which are noted to disappear upon mood recovery and are therefore not stable underlying vulnerability traits, as the ‘schema vulnerability hypothesis’ would suggest, but are mood activated (Teasdale, 1988). Indeed, longitudinal research has not established negative cognitive biases as independent predictors of depression (Ingram *et al.*, 1998). Segal and colleagues (1999) found that what predicted depressive relapse was not a person’s degree of belief in dysfunctional thoughts, but how easily small changes in their mood triggered these attitudes. Acceptance and mindfulness based therapies have suggested that the clinical change reported by traditional cognitive-behavioural outcome studies are actually due to the changes people make in their *relationship* to their thoughts, rather than to changes made to the *content* of them. Within a clinical context, it has therefore been suggested that an emphasis on ‘decentring’ techniques rather than ‘reframing’ techniques is particularly relevant for problems in which rumination is a factor (Teasdale *et al.*, 2003). It is noted that this emphasis on decentring is similar to the stance of REBT but that whereas identification and challenging of ‘irrational’

beliefs and inferences is key in REBT (again, a form of ‘reframing’ as used by MCT), acceptance and mindfulness-based approaches argue that this approach is not only unnecessary but may be counter-productive because of the risk that it may exacerbate cognitive entanglement (Hayes, 2002) or that the task of identifying negative cognitions may provide further material for ruminative tendencies (Haefffel, 2010). Although these are common claims amongst proponents of acceptance-based approaches, they must be treated with caution. There is indeed preliminary evidence that when using traditional cognitive skills self-help training (in the form of workbooks), the component of identifying and evaluating negative cognitions appears to be associated with *greater* levels of depressive symptoms post-intervention, in a sample of students: particularly in those who ruminate (Haefffel, 2010). However, no similar studies have been conducted which explore this phenomenon in participants experiencing clinically significant levels of depression, or in the use of therapist-provided cognitive therapy. Furthermore, various studies have shown that the use of cognitive therapy alone to treat depression *can* reduce rates of recurrence to 20-36% over at least one year follow-up (Blackburn *et al.*, 1986; Simons *et al.*, 1986; Evans *et al.*, 1992).

One particular mindfulness-based therapy is Mindfulness Based Cognitive Therapy (MBCT; Segal *et al.*, 2002) which was developed specifically in response to the modest initial response rate and high levels of relapse found in patients who received CBT for depression. MBCT focuses on specific cognitive processes associated with depression, including ruminative tendencies. Individuals are taught to develop a decentred awareness of their ruminative state of mind without engaging in the thoughts themselves, with the intention of replacing rumination with a non-

ruminative self-focus. There is some evidence that mindfulness-based interventions reduce rumination (Jain *et al.*, 2007; Ramel *et al.*, 2004; Shapiro *et al.*, 2007) and Shapiro and colleagues (2007) have found that an increase in mindfulness during intervention predicts a drop in rumination. Furthermore, Jain and colleagues (2007) reported that the effects of a mindfulness intervention on reducing distress were partially mediated by reducing rumination. The relationship between rumination and depression is discussed in more detail in section 1.2.3.

1.1.5.4 Acceptance and Commitment Therapy (ACT)

Also within this category of acceptance and mindfulness based therapies is Acceptance and Commitment Therapy (ACT: Hayes *et al.*, 1999). ACT describes itself as a third-wave behavioural therapy, however it differs in its approach to the understanding of psychopathology, including depression, from traditional behavioural approaches. From an ACT perspective, psychopathology can result from or be exacerbated by psychological inflexibility (Hayes *et al.*, 1999). Psychological inflexibility refers to the inability to adapt or modify behaviour (including verbal behaviour) in response to how (un)helpful it is. Within an ACT treatment model, six factors are implicated in contributing to psychological inflexibility. These are cognitive fusion, experiential avoidance, attachment to a conceptualised self, lack of contact with the present moment, lack of clarity of life values, and inaction towards these values (Hayes *et al.*, 2006).

Historically, within a behavioural approach, emphasis would largely be placed on overt behaviour rather than the core emotional experience, even when accounting for the processes of depression (Kanter *et al.*, 2008). Although Skinner did describe the experience of depression as an “emotional condition” (Skinner, 1953, p.165) he emphasised what he saw as the core issue of reduced positive reinforcement in depression which led to reduced social behaviour. However, the limitations of this model in accounting for the variety and complexity of factors initiating and maintaining depression are apparent. ACT does not place such limited emphasis on the role of the emotional experience in depression. Indeed, ACT suggests that experiential avoidance, in which attempts are made to avoid or control one’s internal experiences, is implicated in most forms of psychopathology (Hayes *et al.*, 1996). In support of this, a recent meta-analysis by Aldao and colleagues (2010) found that avoidance had a medium size relationship with psychopathology. In the case of depression it is argued that individuals not only avoid the external situations which occasion depression but also avoid feeling the depression itself (e.g. sadness, fatigue, self-critical thoughts, pessimistic predictions, etc). In this respect, similarities exist with Martell, Addis and Jacobson’s (2001) theory behind behavioural activation. Both theories argue that problematic avoidance in depression is not always a response to the environment per se, but is a response to the core aversive experience of depression (which is in turn considered to be a response to the environment). Furthermore, both models suggest that, once elicited, the core affective experience of depression may play a functional role in maintaining, exacerbating and creating the additional symptoms of depression. Specifically, it may evoke behaviour designed to avoid and escape the private response which is itself negatively reinforced by a

reduction in aversive emotional experience (Barlow, 2002). Indeed, such a functional relationship between avoidance and depression has received some empirical support (Ottenbreit & Dobson, 2004).

ACT further diverges from more traditional behavioural models in that it also offers additional theoretical elaborations that suggest a more prominent role for verbal behaviour. For example, ACT suggests that experiential avoidance repertoires are maintained over long periods of time because they are 'rule governed' or verbally controlled (Hayes & Ju, 1998). For example, it is proposed that rumination is associated with reason-giving i.e. individuals ruminate in order to solve and get rid of their depression by arriving at the reasons or causes for it (Zettle & Hayes, 2002). ACT is based upon a theory of language and cognition called Relational Frame Theory (RFT; Hayes *et al.*, 2001). According to RFT, verbal behaviour, which includes thinking, is technically seen as the behaviour of framing events relationally. It is proposed that verbal behaviour, such as rumination, can magnify and extend normal adaptive experiences of elicited affect, such as a sad mood, into disordered experiences. A more detailed description of the RFT model and its account of rumination is provided in section 1.2.5.6.

In cognitive therapy for depression much emphasis is placed upon challenging distorted cognitive content and shaping the adoption of more balanced reasoning. Many strategies are developed for this purpose and it is considered a primary task of therapy (Beck *et al.*, 1979). However, within ACT the focus is not on directly modifying such psychological events but on changing the function of these events and the individual's relationship to them (Hayes *et al.*, 2006). However the

techniques used to do so differ from those used in MBCT. Within ACT, therapeutic techniques are incorporated specifically to address the further overlapping issues which are suggested to promote psychological inflexibility. For example, it is proposed within ACT that cognitive fusion plays an integral role in maintaining psychological distress, such as that associated with depression. Cognitive fusion is defined in various ways within the ACT literature. One definition is that it is the inability to detect the ongoing process of thinking as distinct from the products of thinking (Fletcher & Hayes, 2005) i.e. during periods of cognitive fusion people may equate thoughts with reality, or as ‘truths about the self’, rather than simply as commentaries on life events and experiences. Within an ACT treatment for depression, techniques are deployed to encourage cognitive defusion i.e. to take a metaphorical ‘step back’ from thoughts and recognise them as transient words, sounds and pictures, without getting caught up in them, thus reducing their impact and influence on other behaviours. This is similar to the intention of mindfulness techniques in which decentring is advocated without engaging in any reframing processes. However, clear differences between the concepts of cognitive defusion and mindfulness can be drawn.

Mindfulness is generally defined as a type of non-judgemental and accepting focus in which attention is brought to internal and external stimuli as they arise, without evaluating them (e.g. Baer *et al.*, 2006). It is acknowledged that mindfulness is related to several procedures described within ACT, including cognitive defusion (Hayes & Wilson, 2003). However, mindfulness is a broader concept than simply focusing on thoughts and the reduction of entanglement with language: it also incorporates acceptance and exposure processes. Again, both of these processes are

also promoted within ACT interventions, though by different means than those employed by Mindfulness Based Cognitive Therapy. It therefore seems that mindfulness is a concept which, although it may promote cognitive defusion, also encapsulates several other processes. The two concepts are not interchangeable.

In addition to defusion techniques, ACT employs further interacting techniques, including exercises aimed to encourage acceptance of internal experiences even if they are unpleasant (i.e. reduce experiential avoidance), increase contact with the present moment (again akin to mindfulness), bring attention to the ‘observing self’ (i.e. encouraging a process of distancing, in which private events such as thoughts are observed rather than engaged with, and ‘the self’ is experienced as distinct from private events), clarifying personal values, and fostering willingness or ‘committed action’ in acting in ways which move in the direction of goals which have been guided by these personal values (Harris, 2006; Zettle & Hayes, 2002).

It is of note that the techniques described thus far are those employed in any ACT treatment. However, within specifically depression-focussed ACT treatments, particular attention is paid to the processes of cognitive fusion, evaluation and self-discrimination, avoidance, and reason giving (Zettle, 2007). It has been proposed that these factors each have a role in the maintenance of ruminative cognitive processes and will be discussed further within the context of RFT. In addition, the specific role of cognitive fusion in relation to rumination and depression is explored further in section 1.4.

1.1.5.5.Overlapping themes within MCT and ACT

Although there are major conceptual differences between MCT and ACT, some overlapping themes are apparent. For example, both MCT and ACT share a focus on reducing judgement and evaluation of personal experience, although there are major differences in the way this is conceptualised and implemented. MCT states that its goal is not acceptance or greater awareness of the present moment, but strengthening of executive control (Wells *et al.*, 2009). Although both MCT and ACT reject conventional CBT techniques such as disputing automatic thoughts, MCT does incorporate verbal techniques such as verbal challenging of the advantages of rumination. Such ‘reframing’ techniques are not included in ACT. However, within both MCT and ACT a prominent role is given to cognitions, or verbal behaviour, in the maintenance of psychological disorders. Verbal thought processes such as rumination are implicated in the maintenance of depression from the perspective of both treatment models, although they differ in their conceptualisation of the drivers for such thought processes and the means by which they maintain depression symptoms. In research exploring vulnerability factors for depression, specific cognitive processes or thinking styles have indeed been found to be associated with both the onset and maintenance of depression: in particular, a ruminative cognitive style. The role of rumination in depression is therefore explored further.

1.2 Rumination

1.2.1 Definition of rumination

It is evident from the literature in the area of rumination that differences in the definition, assessment and conceptualisation of rumination abound (e.g. Smith & Alloy, 2009). However, it is broadly agreed that rumination is a type of repetitive thinking and a form of analytical and problem directed self-focus. As such it can be defined as persistent, recursive, self-focussed attention. Within much of the research on depressive rumination, the response styles theory (RST; Nolen-Hoeksema, 1991) conceptualisation is the most widely cited and it is this definition which will be adopted in this study. According to RST rumination is defined in the following way:

Rumination is a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms. (Nolen-Hoeksema et al., 2008, p.400)

1.2.2 Rumination versus worry

Another form of repetitive thinking is worry. However, it has been argued that there are major conceptual differences between worry and rumination. For example, some studies have indicated specificity of rumination to depression and worry to anxiety

(Fresco *et al.*, 2002; McLaughlin *et al.*, 2007). When directly comparing measures of worry and rumination, researchers have found that they load on different factors and are statistically distinguishable (Fresco *et al.*, 2002; Watkins *et al.*, 2005). There are also distinguishing features noted in both the *processes* and in the *content* of worry and rumination. In comparison with worry, rumination is associated with less effort and less confidence in problem-solving (Papageorgiou & Wells, 2004). It has also been demonstrated that worry thoughts are often future-orientated and focus on anticipated threats, whereas ruminative thoughts tend to be more past-/present-oriented and focus on issues of self-worth, meaning and themes of loss (Beck *et al.*, 1987; Nolen-Hoeksema *et al.*, 2008; Papageorgiou & Wells, 1999). However, although the content of ruminative thought may contain negative themes, Nolen-Hoeksema (2004) contends that rumination as a cognitive style is distinct from the concept of negative automatic thoughts proposed by Beck's (1979) cognitive theory. Rumination is defined primarily by its style rather than its specific content.

1.2.3 The relationship between rumination and depression

Research into the relationship between affect and cognition has highlighted an association between depression and a particular ruminative cognitive style. Indeed rumination appears to have a unique relationship to depression and continues to be related to depression after statistically controlling for several other negative cognitive styles such as neuroticism, pessimism and perfectionism (e.g. Flett *et al.*, 2002; Spasojevic & Alloy, 2001) and after controlling for other general emotional problems (McIntosh, Gillanders & Rodgers, 2010). Research into the role of

rumination has been championed by Susan Nolen-Hoeksema who initially explored the role of rumination in accounting for gender differences in depression rates. Several studies have found that there are gender differences in levels of rumination, with women more likely to ruminate than men (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema *et al.*, 1999; Roberts *et al.*, 1998). Indeed, in some studies, gender difference in rumination has been found to mediate the gender difference in depression (Nolen-Hoeksema *et al.*, 1999; Roberts *et al.*, 1998).

In general, a ruminative cognitive style has been identified as a risk factor for the onset of depression. For example, the presence of rumination has been found to predict the onset of depression in non-depressed individuals (e.g. Just & Alloy, 1997). In one longitudinal study, a group of students were assessed by chance on a measure of rumination and a measure of depression severity just two weeks before a major earthquake (Nolen-Hoeksema & Morrow, 1991). Measures were completed again at intervals of ten days and seven weeks after the event. A regression analysis was conducted and it was found that people who reported before the event a tendency to respond to low mood by ruminating had the highest depression scores following the event, even after controlling for the degree of trauma exposure and loss experienced due to the earthquake. In addition to studies of non-clinical dysphoria, studies regarding clinical levels of depression have also shown that higher levels of rumination represent a vulnerability factor to depression. In a large scale prospective study using a random sample of about 1,300 community participants, it was found that rumination scores at first assessment predicted new onsets of major depressive disorder over the next year (Nolen-Hoeksema, 2000). Significantly, it has also been found that patients who have remitted from depression demonstrate elevated

rumination scores compared to never-depressed controls (Nolen-Hoeksema, 2000; McIntosh *et al.*, 2010) and rumination within this population also predicts future episodes of depression (Huffziger & Kuehner, 2009). For this reason it has been proposed that not only is rumination a core cognitive process in depression, it also represents a cognitive vulnerability to relapse and recurrence (Nolen-Hoeksema *et al.*, 2008; Teasdale *et al.*, 1995).

A link between the presence of a ruminative cognitive style and more prolonged periods of depression has been reported in a variety of prospective longitudinal studies looking at non-clinical participants (Just & Alloy, 1997; Kuehner & Weber, 1999; Nolan *et al.*, 1998; Spasojevic & Alloy, 2001). However, with participants experiencing major depressive disorder, findings regarding the role of rumination in predicting duration of episodes are more equivocal, with some studies finding that a ruminative cognitive style predicts the maintenance of depressive symptoms in depressed individuals (e.g. Umberson *et al.*, 1992) and others finding that it does not (e.g. Arrow *et al.*, 2004; Bagby & Parker, 2001; Kuehner & Weber, 1999; Park *et al.*, 2004; Raes *et al.*, 2006). The suggestion that rumination should predict the duration of depressive moods has therefore been challenged.

It has also been suggested that variation in levels of rumination can predict the severity of the depression experienced (Hong, 2007; Nolen-Hoeksema *et al.*, 2007; Sarin *et al.*, 2005). For example, in Nolen-Hoeksema's (2000) prospective study, it was found that rumination at the first point of measurement predicted depression severity a year later in both adults who were already experiencing clinical depression and in adults who were not. Furthermore, in several experimental studies using

rumination manipulations, it has been found that rumination induction significantly increases dysphoric mood in dysphoric participants but has no effect on mood in non-dysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990). This has led to the suggestion that rumination is depressogenic (Nolen-Hoeksema *et al.*, 1994). Similar laboratory experiments using clinically depressed participants have found similar effects (Donaldson & Lam, 2004; Lavender & Watkins, 2004; Watkins & Moulds, 2005), although in other laboratory based experimental studies it has been found that induced rumination maintains rather than exacerbates negative affect in clinically depressed participants (Huffziger & Kuehner, 2009; Singer & Dobson, 2007). However, caution must be given in interpreting these findings as there can be problems with observational methods of studying emotion regulation. For example, it has been found that some participants have great difficulty in using specific strategies, such as adopting a ruminative cognitive style, as instructed under experimental conditions (Demaree *et al.*, 2006). Yet, it is noted that all of the experimental studies cited controlled for concurrent depression levels, suggesting that a ruminative response style does not merely reflect a cognitive epiphenomenon of depression, and thus further confirming the significance of rumination as cognitive vulnerability factor for depression.

In summary, higher levels of rumination have been found in people who are depressed and people who have recovered from depression. Furthermore, rumination has consistently been found to predict the *onset* and *severity* of depression in both clinical and non-clinical samples, suggesting that rumination represents not only a cognitive vulnerability to depression but is an exacerbating factor of depression symptoms. However, findings for the relationship between rumination and *duration*

of the depressed episode are more mixed in clinical samples, even though rumination does seem to predict duration of depressed mood in non-clinical samples. Nolen-Hoeksema and colleagues (2008) hypothesise that rumination may contribute towards an individual moving from across a metaphorical 'threshold' going from experiencing general low mood into a major depressive episode, but that once they are in an episode of depression, other autonomous, self-perpetuating processes are engaged which maintain and determine the duration of episodes. Furthermore, it has been found that rumination is associated with a variety of cognitive correlates and maladaptive behaviours which could also maintain depression.

1.2.4 Cognitive and behavioural correlates of rumination

It has been found that rumination is associated with poor problem solving beyond what deficits could be accounted for by depressive symptoms (Lyubomirsky & Nolen-Hoeksema, 1995; Donaldson & Lam, 2004; Watkins & Moulds, 2005). In their experimental study, Lyubomirsky and Nolen-Hoeksema (1995) randomly assigned dysphoric and non-dysphoric individuals to an induced rumination condition or an induced distraction condition, and compared performance on a problem-solving task. It was found that performance was significantly reduced in those who were dysphoric and had been induced to ruminate, compared to the other three groups. In a similarly designed study in which a clinically depressed group and non-depressed control group were compared, it was found that both naturally-occurring rumination and induced rumination in those with depression significantly

predicted less effective problem-solving performance. Similar differences have also been found in individuals who have recovered from depression (Watkins & Baracaia, 2002).

Other cognitive correlates have also been identified. For example, studies have shown that individuals who ruminate perform more poorly on tests of cognitive flexibility, such as the Wisconsin Card Sorting Test, which measures set-shifting ability (e.g. Davis & Nolen-Hoeksema, 2000). It is also reported that rumination may be associated with biases in information processing, specifically in a tendency to selectively attend to and recall negative information rather than positive information. For example, negative biases have been found in both the retrieval of autobiographical memories and the generation of predictions about the future, when depressed people have been induced to ruminate (Lyubomirsky *et al.*, 1999). Furthermore, even when controlling for depressive symptoms, self-reported rumination predicts negative bias on an attention measure (Donaldson *et al.*, 2007). Additionally, rumination is also significantly correlated with over-general autobiographical memory (Watkins *et al.*, 2000), biased judgment and perception of others' facial expressions (Raes *et al.*, 2006), pessimistic outlook (Nolen-Hoeksema *et al.*, 1994) and impaired motivation and inhibition of instrumental behaviour (Lyubomirsky *et al.*, 1995; Lyubomirsky & Nolen-Hoeksema, 1993).

Further cognitive and behavioural correlates of rumination are reported to be impaired concentration (Lyubomirsky & Tkach, 2004) and decreased willingness to engage in pleasant or distracting activities (Lyubomirsky & Nolen-Hoeksema, 1993). A recent study also found in a non-clinical sample that higher levels of rumination

was associated with significantly higher levels of self-reported experiential avoidance and greater fear of emotions (Giorgio *et al.*, 2010). Indeed, rumination has also been associated with behaviours such as alcohol abuse (Nolen-Hoeksema & Harrell, 2002) and self-injurious behaviour (Miranda & Nolen-Hoeksema, 2007), both of which can be categorised as experiential avoidance behaviours. However, it is noted that the research cited has not disentangled the direction of relationships between rumination, depression and other variables, so conclusions about causation of other cognitive and behavioural correlates of depression cannot be made.

Nevertheless, various mechanisms have been proposed to account for the effects of ruminative responses on the maintenance of depressive mood (Nolen-Hoeksema, 1987). As previously described, rumination interferes with attentional mechanisms which in turn interfere with the initiation of instrumental behaviours. It has been proposed that a ruminative response style maintains depressed mood because it reduces attention to other more adaptive problem-solving behaviours (e.g. Kuhl, 1981). It has also been suggested that the increased accessibility towards negative information stored in autobiographical memory when a depressed mood has been induced may also account for the relationship between rumination and depression (e.g. Bower, 1981). It has been found that overgeneral memories become more thematic of negative episodes therefore biasing judgement more than specific memories do (Watkins & Teasdale, 2001). Furthermore, it is suggested that a ruminative response style has an effect on the type of explanation individuals provide for their mood state, ergo whilst experiencing a depressed mood, people who adopt a ruminative response style will favour self-deprecating explanations for their mood which, in turn, reinforces the depressive state (e.g. Abramson *et al.*, 1978). Other

explanations have focused on the role of behavioural avoidance within the relationship between rumination and depression. For example, Moulds and colleagues (2007) examined relationships between rumination, behavioural avoidance and depression in a non-clinical sample. They found that cognitive and behavioural avoidance predicted unique variance in depression scores, over and above anxiety and rumination.

These differing explanations for the mechanisms by which rumination interacts with depression and other cognitive and behavioural processes have led to the development of various models of rumination, some of which will be explored in more detail.

1.2.5 Models of rumination

It is noted that there is potential for overlap among many of the models of rumination. However, the models are underpinned by distinct theories. Models of rumination as a response style (RST; Nolen-Hoeksema, 1991), a stress reaction (Alloy *et al.*, 2000), a function of goal progress (Martin *et al.*, 2004), and a conceptual-evaluative self-focus (Watkins, 2004a, 2004b) have been proposed.

These will be described briefly in order to illustrate why they have not been included as the focus of this study (although a full review and critique of each is beyond the scope of this thesis). However, two particular models will be explored in more detail as they form the theoretical underpinning for the cognitive processes which are the particular focus of this study. These models define rumination as a form of self-

regulation governed by metacognition (S-REF; Wells & Matthews, 1994), and as a product of verbal sense-making and cognitive fusion (RFT; Hayes *et al.*, 2001).

1.2.5.1 Response Styles Theory (RST; Nolen-Hoeksema, 1991)

The Response Styles Theory (RST) is a cognitive vulnerability theory for the onset, exacerbation and maintenance of depressive episodes. The theory arose from empirical attempts to explain gender differences in depression and it was suggested that the way in which people respond to their mood is the key issue. Within RST, it is proposed that two different coping styles (rumination and distraction) can be initiated in response to depressed moods and symptoms. A ruminative coping style, which is characterised as maladaptive, comprises of individuals passively focusing attention upon their experience of dysphoric symptoms and on their possible causes and consequences. A distractive coping style, which is characterised as adaptive, is defined as actively turning one's attention away from the depressive symptoms onto pleasant or neutral thoughts and actions. However, it is behavioural activation in response to depressed mood, rather than distraction of attention that appears key. This theory presumes that rumination and distraction are purposeful trait-like styles of responding to, or trying to cope with, negative mood (Nolen-Hoeksema, 1991) and are activated in response to negative affect. However, it is of note that the distraction component of RST has received mixed support (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991) and much of the research in this field has focussed purely upon the role of rumination in depression.

According to RST, rumination is a dysfunctional mode of self-focussed attention which activates and interacts with other cognitive and behavioural factors to promote and maintain depression. It is suggested that rumination activates negative associative memory networks and increases negative thought content which, in turn, interferes with attention, inhibits effective problem solving and other instrumental skills behaviour, and, as a result, disrupts adaptive engagement with social support networks. It is through such processes that rumination is suggested to maintain or exacerbate depressive states, as well as represent a cognitive vulnerability factor for future depressive episodes (Nolen-Hoeksema, 2004; Nolen-Hoeksema *et al.*, 2008).

1.2.5.2 Stress-Reactive Rumination Model (Alloy et al., 2000)

Within the stress-reactive rumination model it is suggested that rumination is based on negative inferences associated with stressful life events. This model is rooted in the literature regarding post-event processing which links stressful events and later ruminative thinking. Within the stress-reactive model it is suggested that rumination is an attempt to process information related to a stressful interpersonal interaction or traumatic event. The parallels with theory regarding the prevalence of intrusive thoughts in Post-Traumatic Stress Disorder are apparent, and the role of intrusive memories in depression has been the focus of increasing research interest over recent years with treatment techniques such as imagery rescripting being employed (e.g. Wheatley *et al.*, 2007). However, a potential limitation of this model is that it is restricted to accounting for the presence of thoughts related to stressful events rather than more general negative evaluative self-focus.

1.2.5.3 Goal Progress Theory (Martin et al., 2004)

Within goal progress theory it is suggested that rumination is a self-regulatory process which occurs when there is goal discrepancy i.e. when an individual perceives that they are not adequately progressing towards a specific, individually valued goal. It is suggested that information regarding incomplete goals is likely to remain on an individual's mind, perhaps in the form of rumination. Martin and colleagues (2004) argue that support for this theory lies in the finding that people more readily recall information about incomplete tasks rather than completed tasks. They suggest that rumination keeps information related to the goal in memory longer and although it may not ultimately aid goal progress, this is the intended function. It would therefore appear that within goal progress theory rumination is an intentional strategy adopted in order to aid goal attainment.

1.2.5.4 Conceptual-Evaluative Self-Focus (Watkins, 2004a, 2004b)

Based upon Teasdale and Barnard's (1993) multi-level conceptual framework known as Interacting Cognitive Subsystems (ICS), it is suggested that self-focus can occur in one of two forms. Conceptual-evaluative self-focus is analytical, evaluative thinking about the self which focuses on discrepancies between current and desired outcomes. In contrast, experiential self-focus is an adaptive form of self-focus which is described as non-evaluative, intuitive and in the moment awareness of experience. It is suggested that the content of thought is not necessarily different across the two styles but that the individual's relationship with their thoughts differs,

i.e. it is the contextual factor of the thinking style which is of crucial importance in determining whether the self-focus will have a negative impact. Within the ICS framework it is proposed that an individual can only focus consciously on information within one mode at any moment in time. From an ICS perspective, self-focussed processing of emotional material is adaptive and facilitates processing in the experiential mode, but is maladaptive and prevents effective emotional processing in the conceptual mode. It is suggested that rumination is a 'depressive interlock' which occurs within the conceptual mode and, at times of lowering mood, habitual patterns of cognitive processing switch in relatively automatically and this thinking intensifies depressed mood which, in turn, leads to further thoughts. According to ICS, learning to become aware of one's 'mode of mind' and disengage from it can facilitate movement from a conceptual to an experiential mode, thus interrupting this depressive interlock.

1.2.5.5 Self-Regulatory Executive Function Model (S-REF; Wells & Matthews, 1994, 1996)

Wells and Matthews' (1994) S-REF model is an integrative information processing model of emotional disorder. It proposes that dysfunctional processing is associated with emotional disorder. Generally, Wells and Matthews (1994) suggest that within emotion-related processing operations, different configurations of processing can be identified within an 'architecture' of three interacting cognitive levels. These three levels comprise of a level of automatic and reflexively driven processing, a level of attentionally demanding, voluntary (i.e. controlled) processing, and a level of stored

knowledge or self-beliefs (Wells & Matthews, 1996). It is proposed that the configuration most relevant in emotional disorder involves the latter two levels: controlled processing and self-beliefs. In other words, the configuration most relevant in emotional disorder consists of self-regulatory processing driven by self-beliefs. It is *this* configuration which is known as self-regulatory executive function (S-REF). Within the S-REF model, processing performs appraisal of external events and physical reactions, and appraisal of the significance of thoughts (i.e. metacognition) which, in turn, guides subsequent cognitions. It is suggested that because this process takes place in the controlled processing level, which is of limited capacity, it is sensitive to attentional resource demands. Furthermore, operations carried out within the controlled processing level are guided by self-knowledge or self-beliefs. These beliefs include declarative beliefs or procedural beliefs. Procedural beliefs are proposed to direct the activities of the controlled processing system i.e. they direct self-attention, memory retrieval, appraisal and meta-cognitive processing in response to stimuli. One particular set of activities within the controlled processing system is said to contribute to emotional disorder and relapse following treatment. This set of activities is known as the cognitive-attentional syndrome (CAS) and consists of heightened self-focused attention, reduced efficiency of cognitive functioning, activation of self-beliefs and self-appraisal, attentional bias and capacity limitations (Wells & Matthews, 1996).

One particular component of the CAS is perseverative negative thinking in the form of worry or rumination. This is viewed as a coping strategy that is counterproductive in that it ultimately perpetuates emotional disorder. It is suggested that this is due to three factors: 1. Ruminating depletes resources within the limited capacity controlled

processing level, thus reducing the resource available needed for execution of plans which would disconfirm dysfunctional beliefs; 2. Ruminating continuously primes dysfunctional self-beliefs thus reducing the threshold for intrusion of congruent information into consciousness i.e. attention becomes more valenced; 3. Active rumination of a verbal-conceptual nature is suggested to impede emotion processing.

According to the S-REF model, repetitive thoughts are generated by attempts to cope with discrepancies between perceptions of a current state and a goal. Furthermore, it is suggested that within the CAS, an individual's selection and engagement in cognitive processing styles such as rumination or worry is supported and directed by underlying metacognitive beliefs concerning the function and consequence of these processing styles. More simply, rumination is a misguided emotion regulation strategy that individuals engage in because they believe it will help them solve problems. An example of such metacognition would be "ruminating about my depression helps me to understand past mistakes and failures". This metacognitive model has been proposed as a basis for understanding the persistence and recurrence of depression (Wells *et al.*, 2009).

In summary, within the S-REF model, vulnerability to depression can be traced to the ease with which an individual activates the CAS in response to lowered affect. This, in turn, is linked to individual differences in metacognitive beliefs and the degree of flexible executive control over processing (Wells *et al.*, 2009). It would therefore seem that the S-REF model emphasises the intentional nature of adopting rumination as a cognitive style. Furthermore, although not focusing specifically on the content of the ruminative thoughts themselves, emphasis is placed upon the pivotal nature of

the content of thoughts *about* the ruminative thoughts i.e. on the content of metacognitions. The S-REF model proposes that it is these metacognitive beliefs which drive rumination and this has led to the development of a clinical metacognitive model of rumination and depression (Papageorgiou & Wells, 2003, 2004). This will be explored further in section 1.3.

1.2.5.6 Relational Frame Theory (RFT; Hayes et al., 2001)

RFT is the theoretical framework which underpins Acceptance and Commitment Therapy (ACT). It has its roots in the philosophy of functional contextualism, a particular philosophy of science. Essentially, this philosophy maintains that behaviour can only be fully understood within its current and historical context and that in order to fully understand a behaviour, its *function* within its particular context must be understood. For example, it is argued that analysing the problem behaviours, or behavioural symptoms, of a patient without considering the contexts that participate in the event will miss the nature of the problem and, furthermore, miss potential solutions (Hayes, 2004). In addition to the perspective of the importance of understanding a person's behaviour in relation to its function in context, functional contextualism also applies this same argument to the behaviour of the scientist and the behaviour of the clinician. In this manner, the analyses of the behaviour that are provided by either the clinician or scientist are not thought to be 'true' in the traditionally understood sense that scientists 'uncover' the truth of the universe. 'Truth' from a functional contextual perspective is determined only by the pragmatic utility of the analysis, in relation to a specified goal. It is proposed that an

understanding of the functional properties of a behaviour, rather than simply its topography, is required in order to understand the pragmatic ‘truth’ of these behaviours and, in doing so, specific scientific goals can be set against which to apply this ‘truth’ criterion, allowing for the prediction and influence of said behaviour.

Within RFT, it is suggested that the contextual factors within which behaviours occur are also social-verbal in nature. Emphasis is placed on the role of language in understanding behaviour, as it is proposed that events acquire their psychological function through both directly experienced and verbally mediated events. RFT proposes that language and cognition are based on relational framing. In essence, it is argued that individuals respond to one stimulus based on its relation to another stimulus. However, this relational responding is under contextual control i.e. humans respond to events in terms of other events, and their response is shaped by the social-verbal context in which it occurs. Inherent in this relational learning is ‘bidirectionality’, also known within RFT as ‘mutual entailment’. For example, if a person learns that A relates to B in a certain way, in a particular context, then they also learn there is some kind of relation between B and A in that context too. More and more events or stimuli can then be compared, known as ‘combinatorial entailment’, each in relation to each other. Further responses can then be *derived* without having to be directly trained. Essentially, when we think, speak, listen, or reason, we do so by deriving relations among events. In this theory, ‘events’ can also mean ‘words’. So, it is suggested humans derive relations among words and events, words and words, and events and events. Certain contexts can then lead the non-arbitrary properties of the ‘events’ to become less important than the arbitrary

property that we know as ‘symbolic meaning’. For example, in a given context, the non-arbitrary properties of the word ‘disgust’ (e.g. the sound of the word or the feeling of making the word with one’s mouth) are much less important than the arbitrary properties (e.g. the feeling it represents).

Furthermore, it is proposed that a defining property of relational framing is that it enables the transformation of stimulus functions i.e. the change in function of one stimuli within a particular relational network will result in the same function being transferred to other stimuli within the network (Barnes-Holmes *et al.*, 2004). An example is given by Zettle (2007) of this process as applied to loss. A man who has divorced and then hears his wedding song on the radio may experience emotional pain. The stimulus function of the song has been transformed into something negative and painful. In other words, relational frames allow people to experience pain regardless of the situation, so unable to control pain by situational means, they begin to try to avoid the painful thoughts and feelings themselves, leading to experiential avoidance. Experiential avoidance is defined as the attempt to escape or avoid private events such as thoughts, feelings, memories, even when attempting to avoid them causes psychological harm (Hayes *et al.*, 1996) and, as discussed in section 1.1.5.4., experiential avoidance is implicated by ACT in most forms of psychopathology, including depression (Giorgio *et al.*, 2010).

In this way, RFT suggests that basic language functions can exacerbate psychological difficulties. Another example involves the process of combinatorial entailment, in which more and more relations are derived. This occurs through a process of ‘comparative framing’, with relations being compared and contrasted in

order to derive new relations. It is proposed that this process of comparative framing will inevitably lead to a process of making comparative evaluations, which can then go on to include negative self-evaluations e.g. “I’m not as pretty as her” (Zettle, 2007). It is of note that negative self-evaluations and self-discrimination is associated with depression and can be a feature of the content of depressive rumination.

It is also proposed that basic language functions can lead to cognitive fusion (Hayes *et al.*, 2001). Relational networks are maintained by myriad derived relations and are automatically reinforced when people experience effective outcomes from relating events. Eventually, stimulus functions from relational frames dominate over other sources of behavioural regulation, so that, according to Hayes (2004), the individual is ‘less in contact with the here and now experience and direct contingencies and more dominated by verbal rules and evaluations’ (p.650). In this way, an individual can become caught up in language and entangled with their thoughts, so thoughts can seem to be truths about the self, rules to be obeyed or events that require full attention. The more the individual becomes fused with their thought, the more influence it has over their behaviour. It is suggested by ACT that this process is complicit in maintaining depression (Zettle, 2007).

Finally, it is proposed by RFT that relational framing promotes the use of rule-governed behaviour. It is suggested that, within depression, a form of rule-governed behaviour is ‘reason giving’, in which reasons or causes are sought for private experiences. Again, this appears to be a component of ruminative thought content. It has been suggested that people ruminate, at least in part, to find reasons or causes

for their depression (Zettle & Hayes, 1986). This reason giving is deemed problematic because reasons which make reference to private events such as thoughts and feelings may begin to be believed as causes for the behaviour. It is suggested by RFT that we learn at an early age, within the context of the social-verbal community, that thoughts and feelings are acceptable reasons for behaviour. Thus, these private events become viewed as causal and necessary to change before other behaviours can be changed. Furthermore, reason-giving promotes asking and answering “why am I depressed?” which, in turn, increases self-blame (Zettle, 2007). Indeed, Addis and Jacobsen (1996) found that people with depression who could offer “good reasons” for their depressed behaviour tended to be more severely depressed and more difficult to treat than people who did not.

In summary, within the RFT model, vulnerability to depression is context-dependent, and social-verbal learning is implicated throughout. Processes such as experiential avoidance, self-evaluation, cognitive fusion and reason-giving are all implicated in relational framing and are all involved in initiating and maintaining depression. Furthermore, self-evaluation and reason giving are both suggested components of ruminative thought. However, also implicated in the maintenance of psychopathology is cognitive fusion. Furthermore, it is possible that cognitive fusion plays a role in promoting the ruminative process. For example, the more fused a person is with their thoughts the more they may become entangled in self-evaluations. This may encourage both further reason-giving and attempts to avoid or escape the painful feelings evoked. If reason-giving is a strategy of rumination, then greater cognitive fusion may drive increased rumination. This will be explored further in section 1.4.

1.2.5.7. Overlapping themes within the models of rumination

Although the models reviewed propose differing explanations for why individuals engage in and maintain a ruminative cognitive style, some unifying themes emerge. They broadly propose that rumination is a cognitive activity in which people become immersed, which is repetitive and which is difficult to suppress. However, the models appear to be broadly placed on a continuum between two distinct categories, when accounting for the mechanisms by which the mental process of rumination contributes to depression. At one end of the continuum, explanations focus upon the content of thoughts in accounting for the role rumination plays within depression. At the other end of the continuum, it is the context of thought processes which is identified as determining the relationship of cognitive processes such as rumination, with depression. However, others are balanced between these two poles, placing emphasis on the interplay between these two categories in explaining the relationship between rumination and depression. Closer analysis will now be given to two constructs which have been implicated in rumination and depression: metacognitive beliefs and cognitive fusion.

1.3 Metacognitive beliefs

As discussed in section 1.2.5.5 the S-REF model hypothesises that metacognitive beliefs play a key role in the development and persistence of emotional disorders in general. Furthermore, Wells and Matthews (1994) propose that the knowledge base (i.e. metacognitive beliefs) of emotionally vulnerable individuals is responsible for predisposing them to select and engage in rumination.

1.3.1 Definition of metacognition

Metacognitions refer to beliefs and appraisals about one's thinking and the ability to monitor and regulate cognition. (Papegeorgiou & Wells, 2001b, p.160).

Generally, metacognition is understood as the process of thinking about thinking. However, within depression it is proposed that specific metacognitions regarding the benefits of rumination go on to drive the ruminative process i.e. the metacognitions associated with depression consist of positive beliefs about the benefits and advantages of adopting a ruminative processing style (Wells *et al.*, 2009).

1.3.2 The relationship between metacognitive beliefs, rumination and depression

According to the metacognitive model of rumination and depression, individuals are initially motivated to engage in rumination because of a set of positive beliefs they hold about the advantages and benefits of rumination. In the long-run however, they will begin to experience negative consequences of ruminating and will appraise this ruminative thinking as harmful and uncontrollable which, in turn, will fuel depressive feelings (Papageorgiou & Wells, 2003, 2004). Indeed this proposal that people who ruminate have underlying beliefs which support their rumination has also been advocated by Lyubomirsky and Nolen-Hoeksema (1995) when they reported that dysphoric individuals who ruminated about their mood believed that rumination helped them to gain insight into their problems and emotions. Watkins and Baracaia (2002) also found that the majority of dysphoric ruminators within their study reported at least one perceived benefit of rumination, such as believing it increased self awareness or helped them to solve problems.

1.3.3 Relevant research on metacognitive beliefs

In exploring their S-REF model and the role of metacognition, Papageorgiou and Wells (1999) carried out a study in which they used a semi-structured interview with participants with anxiety or depression. They examined whether people have different metacognitions in relation to depressive and anxious perseverative thinking. They found that depressed participants believed that rumination was helpful for

solving problems and understanding their depression. However, they also reported finding rumination to be uncontrollable and dangerous. Within this study, a positive relation between self-reported depression and low confidence in problem-solving abilities (when controlling for anxiety) was also obtained. Papageorgiou and Wells (2001a) went on to conduct further semi-structured interviews with patients with recurrent major depressive disorder and found that all of the patients held both positive and negative metacognitive beliefs about rumination. From this, they went on to develop a metacognitive measure, the Positive Beliefs about Rumination Scale (PBRS), which asks specifically about positive beliefs regarding the uses and advantages of ruminating (Papageorgiou and Wells, 2001b). The scale was developed using the metacognitive beliefs elicited from the previous interview-based study. A pool of 16 items was derived from positive beliefs reported by patients in the study which were then revised to 9 items.

Implementing the PBRS within a clinical sample, Papageorgiou and Wells (2001b) found that clinically depressed individuals held more positive beliefs about rumination, compared to those who had never been depressed. However, it is noted that within this study they used a small sample (n=12 in each group). In a similar study, Watkins and Moulds (2005) carried out a replication and extension, comparing adults with depression, adults recovered from depression and adults who had never been depressed. Within this study they used an adapted version of the positive beliefs about rumination scale (PBRS-A) because of the possibility that there may be confounds within the original PBRS measure between the severity of depressed mood and endorsement of beliefs. Watkins and Moulds (2005) highlighted that all nine items on the original PBRS refer to ‘rumination’, and five items refer to ‘my

depression'. They suggested that depressed participants may endorse the items more than never-depressed participants simply because the PBRs reflects a more negative valence which is more consistent with the mood state and response bias of the depressed participants. Items such as 'I need to ruminate about my problems to find answers to my depression' were therefore changed to 'I need to think about things to find answers to how I feel'. Within this larger scale study (n=98) Watkins and Moulds (2005) found that both recovered and currently depressed individuals endorsed comparable levels of positive beliefs about rumination, and that this was significantly greater than compared to those who had never been depressed. They suggested that these findings supported the hypothesis that metacognitive beliefs about the benefits of rumination are not merely a function of mood state but may be a cognitive factor that is associated with depression recurrence. They also endorsed the view that positive metacognitive beliefs about rumination increase the frequency of rumination which, in turn, increases depression severity. It was concluded that the Papageorgiou and Wells (2001b) findings were not the result of methodological confounds such as criteria contamination in the PBRs or small sample size. However, one potential limitation of this study is that all participants were given both the PBRs and the PBRs-A to complete at the same time. Overlap in responding may therefore have been due to response bias and criteria contamination may have continued to be an unanticipated issue regardless of the measures taken to prevent this.

In two further larger scale studies, Papageorgiou and Wells (2003) went on to investigate the relationships between rumination, depression, and metacognition in adults with clinical depression (Study 1, n=200) and in adults without depression

(Study 2, n=200). They used measures of metacognition, including the PBRS, and found that positive metacognitive beliefs were a predictor of rumination in both depressed participants ($\beta = 0.31, p < .05$) and in participants without depression ($\beta = 0.58, p < .05$). Similar findings were also reported in a study of depressed men and women with and without a history of assault (Barnhofer *et al.*, 2006). It is apparent that these cross-sectional studies all link metacognitive beliefs about the benefits of rumination with self-reported rumination. However, few experimental studies have yet been carried out exploring this link. An exception is Moulds and colleagues' recent (2010) laboratory-based study of 158 undergraduate students. Within this study, two groups were selected of high and low ruminators. One of three possible conditions was then applied across both groups: a laboratory-based stressor involving negative feedback on a forced-failure anagram task, positive feedback on the task, or no feedback on the task. Participants with strong positive beliefs about the benefits of rumination reported more rumination about their performance, subsequent to the task, regardless of whether they received negative, positive or no feedback. This was in spite of the feedback conditions having the intended effect on mood. Furthermore, baseline measures in naturally-occurring (trait) rumination taken beforehand revealed that this difference between high and low ruminators after the task could not be attributed to any differences in trait rumination. These findings further support the role of metacognition in rumination, however the authors acknowledge that they cannot make conclusions about the direction of the correlational relationships they observed, and suggest that it is possible metacognitive beliefs and rumination have a bi-directional relationship.

Finally, studies examining the treatment outcome for therapies designed specifically to address metacognition in depression are scant. One, more general, treatment outcome study which looked at the effectiveness of an Attention Training Technique (ATT; Wells, 1990) in the treatment of major depression, showed decreases in metacognition following treatment (Papageorgiou & Well, 2000). In the ATT program, patients were encouraged to practice auditory monitoring exercises that required progressively greater attention, with phases of selective attention, attention switching and divided attention. Measures of depression, rumination and metacognition taken at pre- and post-treatment and 12 month follow up showed substantial decrease at post-treatment which was maintained at follow-up. Papageorgiou and Wells (2004) suggest that further studies are required evaluating the effectiveness of specific strategies or techniques designed to modify metacognitive beliefs about rumination in depression.

However, in spite of the somewhat limited evidence base for the role of metacognition in rumination and depression, findings thus far are promising and suggest that metacognitions in the form of beliefs about the benefits of rumination are common and proximal factors in determining the frequency and stability of rumination in samples that have a tendency to ruminate. The inclusion of measures regarding metacognitions is therefore warranted in studies on the relationship between cognitive processes and psychopathology.

1.4 Cognitive Fusion

As explored in section 1.2.5.6, RFT proposes a key role for cognitive fusion in the development and maintenance of psychopathology generally, and in depression specifically. RFT and ACT treatments for depression also suggest a theoretical link between cognitive fusion and ruminative thinking (Zettle, 2007).

1.4.1 Definition of cognitive fusion

Various definitions of cognitive fusion abound. However, it is clear within the literature that fusion means more than simply ‘believability’ or literality of thoughts. Instead, within the RFT model, cognitive fusion refers to contexts in which people get so caught up in the content of their thoughts that it dominates over other sources of behaviour regulation (Luoma *et al.*, 2007). In other words, ‘cognitive fusion’ describes a process of entanglement in thoughts, so that verbal rules and evaluations dominate over contact with ‘here-and-now’ experience, leading to an inability to psychologically distance the self from language-based internal events. Healy and colleagues give the following explanation:

In clinical terms, clients are described as being “fused” with their thoughts when they believe that their thoughts say something important about who they are. (2008, p. 623).

For example, the thought “I’m ugly” is no longer experienced as a thought or passing commentary, but as something ‘truthful’ and important about who they are. The

meaning of the thought is experienced as intensified and significant (e.g. “ I am really ugly and nobody could ever be attracted to me”) and feels distressing or painful.

1.4.2 The relationship between cognitive fusion, rumination and depression

According to the RFT model and ACT, the factors which can shift normal experiences of dysphoria into clinical depression are associated with language. Attempts to avoid, escape or control dysphoria, or simply to “not feel bad” (Hayes, 2005), lead to further increased dysphoria and this ongoing downward spiral culminates in depression. The kinds of avoidance strategies referred to here, are not activity based distraction and activation, but passive withdrawal, thinking and reason-giving (which is reinforced by the verbal culture). The processes which are implicated in this spiral are language based, and it is recognised that rumination is a key contributor in the pathway from dysphoria to depression. In this model, rumination can be seen as a perseverative attempt to problem-solve, in part by finding reasons for the depression, and this process then limits contact with the present moment (Zettle, 2007). Indeed, in a self-report questionnaire study using undergraduates, reason-giving for depression, psychological inflexibility and depression were all found to be significantly related (Garst & Zettle, 2006). RFT proposes that cognitive fusion is implicated in promoting this ruminative process.

Cognitive fusion is one of several processes which arises through social-verbal learning, and the functionality of this process, as with any behaviour, is context dependent. It is therefore the case that some (internal and external) contexts will lead to greater fusion than others. With increasing fusion, behaviour becomes increasingly directed by derived verbal stimulus relations and rules, rather than from direct contact with what actually works. For this reason it is proposed that cognitive fusion may lead to attempts to ‘manage’ thoughts in unworkable ways, such as through perseverative thought processes like rumination. In attempting to reason away the depressive thoughts, ruminative content may become elaborated. Similarly, researchers have found that attempts to suppress or avoid painful internal content often results in the strengthening of that content (Davies & Clark, 1998; Freeston *et al.*, 1991). Additionally, the ruminative process can result in a narrowing of behavioural repertoires and missed opportunities to learn from experience and move towards life values. Within the RFT model it is argued that social and verbal learning teaches us that emotions and thoughts are valid causes for behaviour. This encourages the use of emotions and thoughts as ways to regulate behaviour, which leads to a narrowing of behavioural responses. In the case of rumination, this becomes problematic when reasons found for the depression during the ruminative process make reference to private events which are then seen by individuals as causes of the depression. This leads to the perception that private events must themselves be changed or controlled in order to overcome the depression.

Avoidant coping and reason-giving have been proposed to serve the function of experiential avoidance. Symptoms such as anhedonia and feeling “numb”, described by those experiencing depression are proposed to function as escapes from emotional

distress (Zettle, 2007). Within research studies, there are claims that experiential avoidance is implicated in depression. For example, Tull and Gratz (2008) found that experiential avoidance as measured by the Acceptance and Action Questionnaire (AAQ; Hayes *et al.*, 2004) mediated the severity of depression in participants. However, caution must be given in interpreting the results of studies using the AAQ. It is acknowledged by Hayes himself that the AAQ is often referred to as a measure of experiential avoidance but is actually more generally a measure of several ACT processes which bear on 'psychological flexibility', including experiential avoidance, cognitive fusion and willingness to act in the presence of difficult private events (Hayes *et al.*, 2006). Using this general measure, it was found in a laboratory study by Gird and Zettle (2007) that participants with lower levels of psychological flexibility responded with significantly greater levels of distress to an induction of dysphoric mood even though initial levels of mood were comparable. Additionally and perhaps more significantly to our understanding of the role of experiential avoidance in depression, it was found in another laboratory study that participants with depression who were asked to suppress rather than accept their emotions displayed higher heart rates and significantly more negative affect when watching an emotion-provoking film (Campbell-Sill *et al.*, 2006). However, in looking specifically for evidence of the role of cognitive fusion in depression, empirical evidence is somewhat limited.

1.4.3 Relevant research on cognitive fusion

In an early ACT outcome study for depression, an early version of ACT called Comprehensive Distancing was compared with Cognitive Therapy (Zettle & Hayes, 1986), though the small sample size should be noted ($n=6$ in each group). Post 12 week treatment and at 2 month follow up depression scores were lower for the Comprehensive Distancing (CD) group. Additionally, scores on the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) showed no difference between groups on the frequency of depressing thoughts but significantly reduced scores for the validity for reasons for dysfunctional behaviour scale were found in the CD group, as were scores for the believability of thoughts scale. This outcome was interpreted as indicating that greater levels of cognitive defusion had occurred within the CD group. In a later re-analysis of this data (Hayes *et al.*, 2006), it was shown that the believability of depressogenic thoughts, as measured half-way through treatment, fully mediated outcomes at follow up. However, it is also noted that 'believability' is a narrow component of the more recently used definition of cognitive fusion within ACT theory.

Another study which may be relevant to evidence the role of cognitive fusion in psychopathology is a study on psychosis, rather than depression. In this study, Bach and Hayes (2002) compared ACT with treatment as usual (TAU) for patients with psychosis. TAU consisted of medication, attendance at three or more psychoeducational groups and, for those hospitalised for more than a few days, individual psychotherapy sessions once a week. After discharge, TAU included case management services and monthly medication review with a Psychiatrist.

Additionally, 60 per cent of outpatients within the TAU group also undertook psychosocial rehabilitation classes or psychotherapy. At outcome, ACT group participants were found to be more likely to report psychotic symptoms but rated them as less believable, and were three times less likely to be readmitted to hospital than the TAU participants. This finding was interpreted as an indication that cognitive defusion had occurred more in the ACT group and although participants still experienced cognitive symptoms, they were less likely to live as though they were true. These findings have since been replicated (Gaudio & Herbert, 2006a, 2006b). This suggests that ACT can provide benefits beyond symptom reduction and, again, indicates cognitive defusion processes may play a part in ACT outcomes. However, it is noteworthy that once again the narrow measure of ‘believability of thoughts’ is being used as a ‘barometer’ of cognitive fusion.

In terms of assessing the specific ACT core component of cognitive fusion within depression, partial assessment of this process has been carried out in the studies already described by using the Reasons for Depression Questionnaire (RFD; Addis *et al.*, 1995). The RFD measures how much people believe that certain factors such as childhood are reasons or causes for the depression. Additionally the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) which measures frequency of depressogenic thoughts has also been used. This measure contains a scale for rating the believability of these thoughts. As we can see, the studies mentioned have assessed only one aspect of cognitive fusion i.e. believability of thoughts. More recently, a comprehensive self-report measure of cognitive fusion has been developed: the Cognitive Fusion Questionnaire (CFQ28; Gillanders *et al.*, 2010).

This has also been shortened into a 13 item measure: the CFQ13. Items on these scales address fusion with cognitions in general rather than with a specific set of cognitions. Furthermore, a broad range of aspects of cognitive fusion are explored, by questionnaire items, such as taking thoughts literally, seeing thoughts as reasons for action, taking a detached perspective on thoughts and overanalysing situations, rather than focussing solely on believability of thoughts. Validity and reliability is now well established for this measure across 1074 adult community participants without psychological disorder, and 54 people recruited from a mixed mental health population with Axis I or Axis II disorders (Gillanders *et al.*, 2010). However, cognitive fusion as measured by the CFQ28 has not yet been researched specifically with adults with a diagnosis of depression.

In terms of intervention component analysis, studies looking specifically at the process of cognitive *defusion* are slightly more abundant. Cognitive defusion is one of the ACT treatment processes. Techniques which address defusion are intended to create a 'de-fused' perspective on psychological content thus permitting greater behavioural flexibility. In effect, individuals are encouraged to view their thoughts as just thoughts, and themselves as more than just the sum of their thoughts and personal evaluations. There is some indirect evidence to support efficacy of cognitive defusion strategies, such as the findings of a chronic pain cold pressor analog study in which an ACT protocol was applied which focused on acceptance and defusion (Takashi *et al.*, 2002). Within this study, participants ($n=28$) were randomly assigned to an acceptance and defusion exercise, an exercise designed to control pain or an attention-placebo control. Only those in the acceptance and defusion group showed positive changes in pain tolerance. However, it is noted that

assumptions cannot be made that changes were necessarily due to increased defusion per se.

Perhaps a more relevant study is Masuda and colleagues (2004) time-series experimental analogue study using a cognitive defusion technique. During this study, participants ($n=8$) were asked to think of two one-word negative self-relevant thoughts, such as stupid or fat, and then used a likert-type scale to rate the discomfort and the believability of each thought. One of each pair of thoughts was then randomly allocated to a cognitive defusion exercise and the other to a control condition, such as distraction or thought control. Participants received each intervention three times. Results demonstrated that the defusion technique reduced both discomfort and believability of thoughts significantly more than the distraction and thought-control conditions. Masuda and colleagues (2008) then carried out another two experimental studies of cognitive defusion, using 61 undergraduate participant in the first and 77 in the second. In these studies they investigated the effects of the rapid repetition of a single word. This is a technique introduced in 1910 by Titchener, and it is suggested that when a word is rapidly repeated out loud, the context required for the word to have its literal meaning is altered and removed. In Masuda and colleagues' studies, participants were asked to think of a one-word negative self-relevant thought and then assigned to conditions of either being provided with a defusion technique rationale and brief training in the techniques, or the defusion rationale and training plus varying lengths of application of the defusion technique (either 3 seconds or 20 seconds word repetition in the first experiment, and either 1 second, 10 seconds or 30 seconds word repetition in the second experiment). Again, self-ratings on a likert-type scale were taken before and after for distress and

believability of the word. It was found that, in combination with an applied rationale and training, the rapid repetition of a self-relevant negative thought reduced the thought's believability and emotional discomfort. Emotional discomfort reduced relatively quickly, with 3 second and 10 seconds repetition being effective, whereas believability took longer to reduce, in the 20 to 30 second range. Although word repetition is one of the many defusion techniques used in ACT treatment, these studies were limited in their ability to determine effectiveness as only non-clinical samples were used with one-word thoughts, rather than full sentences.

In contrast, another study by Healy and colleagues (2008) investigated the impact of defusion on a nonclinical sample ($n=60$) in the context of negative and positive self-statements which were presented to participants in either a defused or non-defused format. The defusion component consisted of using the prefix "I am having the thought that..." before each statement, in order to highlight the subsequent statement as a thought and not a fact. This is a technique frequently used in ACT clinical practice. Measures of discomfort, willingness and believability of each of the statements were taken before and after they were presented to the participants. No differences were found in response to the two different presentations of positive statements, however negative statements presented in the defused format resulted in decreased discomfort and believability ratings and increased willingness ratings relative to non-defused statements.

These experimental studies seem to show that techniques which address cognitive fusion appear to reduce emotional discomfort and believability of thoughts in non-clinical populations in the very short term. However, larger scale studies of the

relationship between depression and cognitive fusion, as opposed to purely believability of thoughts, have not yet been carried out. Similarly studies of the relationship between rumination and cognitive fusion have not yet been carried out, and this presents an area of research need within the field of ACT for depression.

1.5 Current study

The metacognitive model predicts that positive beliefs about rumination leads to use of rumination as a strategy. ACT predicts that the more fused people are with their thoughts, the more they will implement cognitive reason-giving strategies such as rumination. Although the metacognitive model and ACT differ significantly in their underlying models and their clinical treatment applications, it is apparent that some overlap exists between them in their emphasis on the role of rumination in maintaining depression. Furthermore, the models do not preclude the possibility that both processes are involved. In exploring the evidence for the ACT and metacognitive theories of rumination and depression, it is apparent that research in these areas is limited. As yet, only a few studies exist looking at the relationship between positive beliefs about rumination and levels of rumination in depression. The same applies for studies looking at cognitive fusion and depression. Furthermore, studies exploring cognitive fusion in depression have used measures which tap into only one facet of fusion i.e. believability, and these studies have neglected to include measures of rumination.

1.5.1 Study Aims

It is intended to explore the relationship between metacognitive beliefs, cognitive fusion, rumination and depression. Furthermore, it is intended to include participants who have recovered from depression in the study. This will help to partially reduce potential confounds between responses to the positive beliefs about rumination scale

and the cognitive fusion scale with responses about depression symptoms. If fusion and positive beliefs are secondary to depression, then elevated scores should only be apparent during depressed episodes. However, it is known that people who have recovered from depression still have elevated rumination scores therefore elevated fusion and positive beliefs in this group will support the hypothesis that both are implicated in ruminative processes.

1.5.2 Hypotheses

In order to specify the expected findings of this study, the following hypotheses will be tested:

Between groups differences

1. In keeping with previous research findings, it is predicted that participants who are currently depressed will report higher levels of rumination than participants who have recovered from depression, and that they will, in turn, report higher levels of rumination than participants who have never experienced depression.
2. Following the proposal that positive beliefs about rumination are a stable store of self-knowledge that are a vulnerability factor for rumination (Wells *et al.*, 2009), it is predicted that both participants who are currently depressed and participants who have recovered from depression will report higher levels

of positive beliefs about rumination than participants who have never experienced depression.

3. Based on the proposal that cognitive fusion promotes the use of ruminative strategies, it is predicted that both participants who are currently depressed and participants who have recovered from depression will report higher levels of cognitive fusion than participants who have never experienced depression.

Relationships between the variables

4. It is predicted that cognitive fusion will significantly correlate with both rumination and depression severity.
5. It is predicted by the metacognitive therapy (MCT) and the acceptance and commitment therapy (ACT) models that the relationship between its components (i.e. positive beliefs about rumination and cognitive fusion, respectively) and rumination and depression, will be stronger. Both of these predictions will be tested.

Chapter 2: Methodology

2.1 Design

A between groups design was used comparing participant responses to a battery of five self-report questionnaires. The responses of three independent groups were compared. Group 1 was a sample of people meeting criteria for current major depressive disorder (DSM-IV-TR; APA, 2000) on the Structured Clinical Interview for DSM-IV (SCID; First *et al*, 1997). Group 2 was a sample of people meeting criteria for no current depression or dysthymia but at least one past episode of major depression on the SCID, and a current CESD score of 15 or less. Group 3 was a sample of people meeting criteria of no diagnosis of major depression or dysthymia in the present or past using the SCID, and a current CESD score of 15 or less.

2.2 Participants

Participants were recruited into three distinct groups;

Group 1: Currently depressed (n = 26)

Group 2: Recovered depressed (n = 21)

Group 3: Never depressed (n = 27)

Participants for Group 1 and Group 2 were recruited from an Adult Primary Care population, both through General Practitioner (GP) services and Primary Care Psychological Services. These services offer a stepped care approach to those with mild to moderate mental health difficulties, including depression and anxiety. Participants for Group 3 were recruited from a non-clinical general adult population through community groups and services.

Participants were selected for the study using the following inclusion and exclusion criteria:

2.3 Inclusion criteria

2.3.1 Recruitment from GP services

Three GP practices agreed to take part in the study directly. All participants were NHS patients, aged 18 to 65, who had attended an appointment with their GP regarding their mood within the past four months, during the period 01/02/2010 to 30/06/2010. All participants who had received a new or ongoing diagnosis of depression from their GP, during this period, and whose details had been entered as such on the services' database (in which patients with depression are identified as part of the Quality Outcome Framework (QOF) guidelines) were invited to participate. QOF is a voluntary incentive scheme for GP practices in the UK, which rewards them for how well they care for their patients. Maintaining data on the number of patients diagnosed with depression is included as part of this scheme.

2.3.2 Recruitment from Primary Care Psychological services

Three Primary Care Psychological services agreed to take part in the study, with consent from the nine GP practices they were attached to. These were different practices from the two who took part directly (please see previous paragraph) in order to avoid potential participants being approached repeatedly. All participants recruited through this route were NHS patients, aged 18 to 65, who had been referred by their GP to the Primary Care Psychological Service, known as ‘The Doing Well Clinic’. They were all awaiting their first appointment and had been first referred during the period 01/02/2010 to 30/06/2010. Only those identified on the waiting list as having been referred for treatment of depression, and who had not yet been seen for assessment, were invited to participate.

2.3.3 Recruitment from community groups and services

Staff from three Secondary schools, members of a choir and members of two running clubs and a golf club agreed to take part in the study. These were all services and groups that the researcher had had no previous contact with and were outside of the local community, in order to ensure having had no personal contact with individuals which may bias participant responses. All participants recruited through this route were aged 18 to 65 and had no known current or past history of depression.

2.4 Exclusion criteria

Participants were excluded from the study if they had known organic brain disease or traumatic brain injury, had a learning disability, had known current co-morbid substance abuse problems, or had a formal diagnosis of post traumatic stress disorder (PTSD), bipolar affective disorder or personality disorder. Those who lacked English comprehension were also excluded due to all interview questions and questionnaires being presented in English. Additionally, participants who had already received any form of cognitive-behavioural therapy were excluded in order to reduce any potential response bias to the questionnaires regarding cognitions. The exclusion criteria were screened for at the first stage of identifying potential participants, either from the GP services' database or Primary Care Psychological Service waiting lists, and again when participants met with the researcher. Similarly, this process also took place when the researcher met with Group 3 control participants.

2.5 Sample size

With regards to power analysis, it was estimated that the effects being explored in hypothesis 1 was likely to be of a large size. This estimate was based on the large effect sizes (Cohen, 1992) reported by McIntosh *et al.* (2010) regarding group differences in rumination between adults with depression and adults with no history of depression ($d = 2.68$). The effect being explored in hypothesis 2 was also estimated to be of a likely large effect size, as Papageorgiou & Wells (2001b) found that

positive metacognitive beliefs about rumination strongly predicted rumination ($d=1.26$). For hypothesis 3 a large effect size was also predicted due to recent findings (Gillanders *et al.*, 2010) regarding group differences in cognitive fusion between a student sample and a mixed clinical sample ($d= 1.35$).

When comparing three groups, sample size calculations based on Cohen (1992) indicate that, with a between groups design, a minimum of 21 participants would need to be recruited into each group in order to achieve power of .80 and to detect a large effect at the $p <.05$ significance level. With regard to carrying out a within subjects analysis in order to explore hypotheses 4 and 5, regression will be used with three predictor variables. With this number of predictor variables and assuming a medium-sized relationship, Tabachnick and Fidell (2001) recommend a sample of 74 or more to test the model fit of multiple regression. It is therefore concluded that a minimum total sample size of 74, with about 24 participants in each of the three independent groups, is required in order to test each of the hypotheses.

2.6 Ethical approval

Ethical approval for this research project was sought prior to commencing data collection. The project was assessed and approved by a Scottish Research Ethics Committee (see Appendix A for letter of ethical approval) and by the local Research and Development Management office (see Appendix B for letter of approval).

2.7 Ethical Issues

It was decided that potential participants for Groups 1 and 2 would not be approached by the researcher in the first instance, in order to ensure patient confidentiality was maintained. Instead, they were first contacted in writing by the service that they were already known to; the GP practice or the Primary Care Psychological service (see Appendix C for example letter). Potential participants were provided with an information sheet at this point and were provided with the contact details of the researcher and an independent clinician that they could ask any questions about the study (see Appendix D for example Group 1/2 information sheet). Participants were invited to opt in to the study if they were interested in taking part, either by returning the reply slip, or making contact with the researcher by email or by telephone.

Furthermore, only adults with a pre-established diagnosis of depression were invited to participate in the study, in order to avoid any potential ethical complications of identifying major depression in adults who were not already aware of their diagnosis. The ethical issue of potentially identifying underlying clinical mood problems within participants of the control group was also considered. Within the participant information sheet for Group 3 (never depressed) participants it stated that, should any underlying clinical problems be detected through the interview process, they would be informed by the researcher and advised to contact their GP (see Appendix E for example Group 3 information sheet). An item within the consent form, given at the point of contact with the researcher, gave the opportunity to consent to this (see Appendix F for example Group 3 consent form) and was a pre-condition of

involvement in the study. This process was followed as it was deemed that *not* passing on information to the participant about an underlying mood disorder would be unethical.

In addition, only community services and groups that were not personally known to the researcher and were not based within their local area were approached to take part in the study. This was in order to ensure people did not feel obliged to participate and that the responses they gave were not biased through having personal contact with or knowledge of the researcher. Instead, people were informed as a group of the project and information sheets were handed out, which also gave the contact details of the researcher and of an independent clinician that they could ask any questions about the study. Participants were invited to opt in to the study if they were interested in taking part, either by returning the reply slip, or making contact by email or by telephone.

Finally, the ethical issue of potential distress to participants who are currently experiencing mental health problems, when discussing and completing questionnaires which ask about their symptoms and thoughts, was considered. This issue was addressed primarily by ensuring informed consent was sought. The information sheet that participants were provided with, at the first point of contact, detailed what would be involved in the study and they were not contacted again unless they opted into the study. When the researcher met individually with each participant, the issue of what would be involved in the study was covered again and the participant was provided with a consent form (see Appendix G for example Group 1/2 consent form). Previous research was also taken into consideration, in

which similar research designs had been used (e.g. McIntosh *et al.*, 2010) and in which any stress to participants had been found to be minor.

2.8 Procedure for recruitment

Ninety GP practices were contacted by the researcher, via the practice managers.

They were each invited to participate in the study either directly or indirectly through the Primary Care Psychological Services attached to their practices. Three GP practices agreed to take part directly, and another nine agreed to take part through the attached Primary Care Psychological service involvement i.e. a total of 13 percent of all GP practices approached agreed to take part in the study. It is not known why the remaining 87 percent did not agree to take part. However, in some cases concerns regarding the demand placed on administrative staff to carry out database and waiting list searches, and to send out invitation letters and information sheets, was cited.

2.8.1 Recruitment directly from GP services

All patients aged 18 to 65, who had attended an appointment with their GP during the four month period from 01/03/2010 to 30/06/2010, and had been given a new or ongoing diagnosis of depression, were invited to take part in the study. All such patients were identified by the GP practice administrative staff from the services' electronic database, in which patients with depression are identified as part of the Quality Outcome Framework (QOF) guidelines. Data was cross-referenced for the

exclusion criteria and potential participants excluded as appropriate. Only staff who routinely had access to this information were involved at this stage of the recruitment procedure. Two hundred and eighteen people were identified and were sent invitation letters and information sheets about the study. A stamped addressed envelope was also enclosed allowing the return of completed opt in slips. Those participants who returned opt in slips or made contact with the researcher directly via email or telephone were met with independently by the researcher. A total of 43 individuals opted into the study (i.e. 20 percent of those contacted opted in). 18 individuals were recruited into the currently depressed group and 19 were recruited into the recovered depressed group. One individual was excluded at the point of screening by the researcher as they informed the researcher that they also had a diagnosis of borderline personality disorder. A further 5 individuals opted in and made contact with the researcher but did not go on to attend the arranged appointment to meet. The attrition rate through this particular recruitment pathway was therefore 12 percent of those who had initially opted in. All of the 37 participants recruited through this pathway were being prescribed antidepressant medication and were continuing to be monitored by their GP. Please refer to figure 1 for a flow diagram of recruitment, response and attrition rates.

2.8.2 Recruitment from Primary Care Psychological services

Three Primary Care Psychological services agreed to take part in the study, with consent from the nine GP practices they were attached to. All patients aged 18 to 65, who had been referred by their GP to the Primary Care Psychological Service during the seven month period of 01/11/2009 to 30/06/2010, for assessment and treatment of

depression, were invited to participate. Only those on the waiting list, who had not yet been seen for assessment, were contacted. Again, the inclusion and exclusion criteria were used to guide selection. This selection process was carried out by the Primary Care Mental Health Workers within the services, who already routinely had access to this information. One hundred and seven people were identified and were sent invitation letters and information sheets about the study by the services' administrative staff. A stamped addressed envelope was also enclosed allowing the return of completed opt in slips. Those participants who returned opt in slips or made contact with the researcher directly via email or telephone were met with independently by the researcher. A total of 12 individuals opted into the study (i.e. 11 percent of those contacted opted in). Following the screening and interview process 8 individuals were recruited into the currently depressed group and 2 were recruited into the recovered depressed group. The attrition rate through this particular recruitment pathway was 0, however 2 individuals were excluded as they met DSM-IV diagnostic criteria for PTSD rather than major depressive disorder. Three participants recruited through this pathway were being prescribed antidepressant medication i.e. 30 percent of those who had opted in through this recruitment pathway and who met inclusion criteria (two within the currently depressed group and one within the recovered depressed group). Please refer to figure 1 for a flow diagram of recruitment, response and attrition rates.

2.8.3 Recruitment from community groups and services

A variety of community groups and services were contacted by the researcher, and information was provided detailing the aims and procedure of the study. The

researcher then requested permission to provide group / service members with information sheets about the study, with the purpose of recruiting participants to Group 3 (never depressed). All those services contacted agreed to information being distributed. The researcher went to each community group / service and gave a brief presentation about the project to the group members, including information about the inclusion and exclusion criteria for participants being sought, and then distributed information sheets which also detailed the researcher's contact details for interested participants to reply to, either via telephone or email. Staff from three secondary schools, members of a choir and members of two running clubs and a golf club agreed to take part in the study. A total of 27 people responded and were met with independently by the researcher. All 27 participants were recruited into the never depressed group, following the screening and diagnostic interview with the researcher.

2.9 Procedure for individual participant meeting with researcher

Once participants had opted into the study, an individual thirty minute appointment was arranged with them. Each participant was met with once only. At the start of the meeting, an opportunity was given for any questions about the study to be asked. The consent forms were then completed. After this, inclusion and exclusion criteria were screened for again and basic demographic information was gathered. This was carried out by asking a set of pre-prepared questions. These were "How old are you?", "Do you have a current diagnosis of any of the following; organic brain disease, traumatic brain injury, learning disability, substance abuse problems, post

traumatic stress disorder, bipolar affective disorder, personality disorder?”, and “Are you currently taking antidepressant medication?”. Following this, participants were then selected into one of the three groups (depressed, recovered depressed and never depressed) with the use of a brief diagnostic interview, the Structured Clinical Interview for DSM-IV (SCID; First *et al.*, 1997). Those who met criteria for current or previous depression were also asked how many episodes of depression they had experienced in total, and how old they were when they first experienced depression. The participant was then supported to complete a battery of self-report questionnaire measures. The brief diagnostic interview and questionnaire measures are discussed in further detail.

2.9.1 Diagnostic interview

Participants within Group 1 must have a primary diagnosis of clinical depression to be included in the study, and participants within Group 2 must have had a previous experience of clinical depression from which they have now recovered. Referrals to outpatient psychology services and patients attending Primary Care GP services tend to experience a mix of psychological disorders including anxiety, post-traumatic stress disorder and others. A diagnostic interview, the Structured Clinical Interview for DSM-IV (SCID; First *et al.*, 1997), was carried out with all participants to confirm the diagnoses. This structured clinical interview follows a set list of questions asking about mood and depressive symptoms both within the past month and at any time in the past. The SCID has been found to have good reliability and validity in the diagnosis of Axis I disorders (First *et al.*, 1997). The diagnostic interviews were audio-recorded in order for a twenty percent sample to be screened

blind by the academic research supervisor (Dr David Gillanders) who has prior experience of using the SCID. This was in order to confirm the reliability of the diagnoses. This requirement was detailed in the information sheet each participant had been provided with and written consent to carry out audio-recordings was sought at the start of each individual meeting with the researcher (see Appendix H for example consent form). There was 100 per cent agreement regarding the presence or absence of current or previous major depression between the author and the academic research supervisor.

2.9.2 Questionnaire measures

Participants were supported to complete a battery of five self-report questionnaires measuring depressive symptoms, rumination, positive beliefs about rumination, experiential avoidance and cognitive fusion. The questionnaires are as follows.

2.9.2.1 Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977)

This is a measure of current level of depressive symptomatology and consists of 20 items rating the frequency with which different symptoms have been experienced within the past week (see Appendix I). Example questionnaire items are “I felt lonely or sad” and “I felt I could not get going”. It emphasises the affective symptoms of depression and is widely used in both research and clinical settings (Thase & Lang, 2004). The CES-D was used within this study because it has been developed for assessing depression in the general population and was therefore felt to be a sensitive measure of depression amongst both control and clinical sample participants. Total scores have a possible range from 0 to 60, with higher scores

indicating higher levels of depressive symptoms. The clinical cut-off score for depression is 16 or more.

2.9.2.2 Short Response Styles Questionnaire (SRSQ; Nolen-Hoeksema & Jackson, 2001)

The SRSQ was derived from the original Ruminative Styles Questionnaire (RSQ; Nolen-Hoeksema, 1991). The RSQ comprises a Ruminative Responses Scale (RRS) and a Distracting Responses Scale (DRS). The RRS is a 22 items scale evidencing very high internal reliability with Cronbach's α ranging from .88 to .92 (Bagby *et al.*, 1999; Just & Alloy, 1997; Nolan *et al.*, 1998; Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema & Morrow, 1991; Nolen-hoeksema *et al.*, 1994). Items focus either on the meaning of rumination, on the subjective feelings related to the depressed mood, on symptoms, and on consequences or causes of the mood. More recently a short version of the scale has been developed (Nolen-Hoeksema & Jackson, 2001) which contains 10 items from the original list of 22 (Appendix J). The 10 items are of different self-evaluative thoughts which are self-focussed and symptom-focussed, such as "I think about how sad I feel" and "I think about my feelings of fatigue and achiness". In general, the scale measures a respondent's tendency to adopt a ruminative self focus in response to depressed mood. The scale was obtained by selecting the items that had the highest item-total correlations with the total score. It is noted by Luminet (2004) that the short version is highly related to the full version of the scale ($r = .90$) and has a high level of internal reliability (Cronbach's $\alpha = .85$). The respondents indicate on a four point Likert-type scale the frequency with which they engage with these thoughts when upset, from 1 ('almost

never’) to 4 (‘almost always’), resulting in total possible scores ranging from 10 to 40. Higher scores on the SRSQ represent more frequent rumination.

2.9.2.3 Positive Beliefs about Rumination Scale - Adapted (PBRs-A, Watkins & Moulds, 2005)

This is a measure of metacognitive beliefs about rumination (Appendix K) which was adapted from Papageorgiou & Wells (2001b) original Positive Beliefs about Rumination Scale. The original nine items, rating the extent to which participants agree with different statements that recurrent thinking and, in particular, recurrent thinking about feelings is helpful, were kept. However, they were rephrased to remove direct mentions of rumination and depression, and to reduce references to negative moods and events. For example, the item “I need to ruminate about my problems to find answers to my depression” was rephrased as “I need to think about things to find answers to how I feel”, and the item “Ruminating about the past helps me to prevent future mistakes and failures” was rephrased as “Thinking about the past helps me to prevent future mistakes and failures”. This was in order to reduce potential confounds within the original measure between severity of depressive moods and endorsement of beliefs about depressive rumination (i.e. criterion contamination). The original PBRs has high internal consistency ($\alpha = 0.89$), and good test-retest reliability over six weeks ($r = .85$) (Papageorgiou & Wells, 2001b). The PBRs-A has good internal consistency ($\alpha = 0.89$) and is reported as significantly correlated with the PBRs ($r=.57, p<.001$) (Watkins & Moulds, 2005).

2.9.2.4 *Cognitive Fusion Questionnaire* (CFQ28; Gillanders *et al.*, 2010)

This is a recently developed measure of cognitive fusion (Appendix L) from which a shorter 13 item measure has also been extrapolated: the CFQ13 (Appendix M). The CFQ28 consists of 28 items rated by respondents on a seven point Likert-type scale for how “true” each statement is for them, from 1 (‘never true’) to 7(‘always true’). Items address fusion with cognitions in general rather than with a specific set of cognitions. The questionnaire also addresses a broad range of aspects of cognitive fusion, such as taking thoughts literally, seeing thoughts as reasons for action, taking a detached perspective on thoughts and overanalysing situations, rather than just focussing on the believability of thoughts. According to Gillanders *et al.* (2010) the CFQ13 has been found to have good internal consistency ($\alpha = 0.85$) as has the CFQ28 ($\alpha = 0.86$). Furthermore, good test-retest reliability has been found ($r=.79$, $p<.001$) (Campbell, 2010) and convergent validity is well established via correlational analysis with other measures (e.g. Dempster, 2009). Validity and reliability is now well established across 1074 adult community participants without disorder, and 54 people recruited from mental health populations (Gillanders *et al.*, 2010). Total scores on this questionnaire range from a possible 28 to 196, with higher scores representing greater levels of cognitive fusion and lower scores representing greater levels of cognitive *defusion*. The full CFQ28 was administered and total scores for the CFQ13 were then extrapolated during the data analysis. Use of the full scale of 28 items allowed for a subsequent further item extrapolation and analysis, in order to address any potential concerns regarding measurement overlap between the SRSQ and the CFQ13. This process is discussed further in section 3.5.

2.10 Data analysis

Quantitative data from the completed questionnaires were analysed by the researcher using Statistical Package for the Social Sciences, Version 19.0.

A series of one-way analysis of variance (ANOVA) were used to examine preliminary hypotheses regarding differences between the three groups (currently depressed, recovered, never depressed) on measures of depressive symptoms, rumination, positive beliefs about rumination and cognitive fusion. Group differences were then investigated using Games-Howell *post hoc* comparisons.

In the second stage of analysis, a path analysis was conducted through the use of a series of multiple regressions (with bootstrapping) using the entire sample, as described by Bramwell (1996), with a maximum of three variables explored at any one time. This allowed a test of the relationships between depressive symptoms, rumination, positive beliefs about rumination and cognitive fusion. In order to address potential concerns about measurement overlap, a further path analysis was carried out (also with bootstrapping) using extrapolated CFQ28 items. Items which were most rumination-related were removed from the CFQ28 data and the analysis carried out again.

Chapter 3: Results

3.1 Overall sample characteristics

3.1.1 Response and attrition rates

In recruiting for the currently depressed and recovered depressed groups, a total of 325 individuals were invited to take part in the study. A total of 55 individuals agreed to be involved, indicating an initial response rate of 17 per cent. However, 5 of these individuals did not attend the subsequent appointment arranged, so the final response rate was 15 per cent. The attrition rate was therefore almost 10 per cent of those who had initially agreed to take part. It is not known why these individuals changed their mind about taking part. Following the diagnostic interview, a further 3 participants were removed from the sample as they met some of the exclusion criteria – one had a diagnosis of borderline personality disorder and the other two met diagnostic criteria for PTSD. The remaining 47 were allocated to the currently depressed and the recovered depressed groups ($N=26$ and $N=21$ respectively). See figure 1 for a flow diagram of recruitment and response rates for these two groups.

All participants recruited from community groups and services for the never depressed group met inclusion criteria ($N=27$) and the attrition rate was 0.

3.1.2 Demographic information

A total sample size of 74 was obtained, 43 female and 31 male. Participant age ranged from 21 to 65, with an average age of 42.8 years ($SD = 11.3$). The gender distribution and mean ages of participants within each of the three groups is detailed in table 1. There were no significant differences between each of the three groups in terms of age or gender.

Table 1. Distribution of age and gender ($N=74$)

Group	Group 1 ($N=26$) Currently depressed N (%)	Group 2 ($N=21$) Recovered depressed N (%)	Group 3 ($N=27$) Never depressed N (%)
Male	11 (42)	9 (43)	11 (41)
Female	15 (58)	12 (57)	16 (59)
Age (years)			
- Mean (SD)	42.35 (12.84)	41.67 (10.95)	44.11 (11.92)

SD = standard deviation

Eighty-five per cent of those who had previously or currently experienced depression reported taking antidepressant medication at the time of inclusion in the study; 77 per cent of the currently depressed group and 95 per cent of the recovered depressed group. None of the never depressed group reported doing so. Of those who had experienced depression, the age of first onset of depression ranged from 14 to 49 years for those within the recovered depressed group and from 14 to 58 years within the current depressed group. The number of episodes experienced of depression (including the current episode) ranged from 1 to 10 in both the currently depressed and the recovered depressed group, and with a modal number of 2 episodes within

both groups. Within the recovered depressed group, the amount of time reported to have elapsed since the last episode of depression ranged from 1 month to 4 years. Due to the large range in time since recovery within the recovered depressed group, correlations between time since recovery and performance on the measures were checked. No significant correlations were found so this does not appear to be a variable which has to be controlled for. Further information about the characteristics of the sample is detailed in table 2.

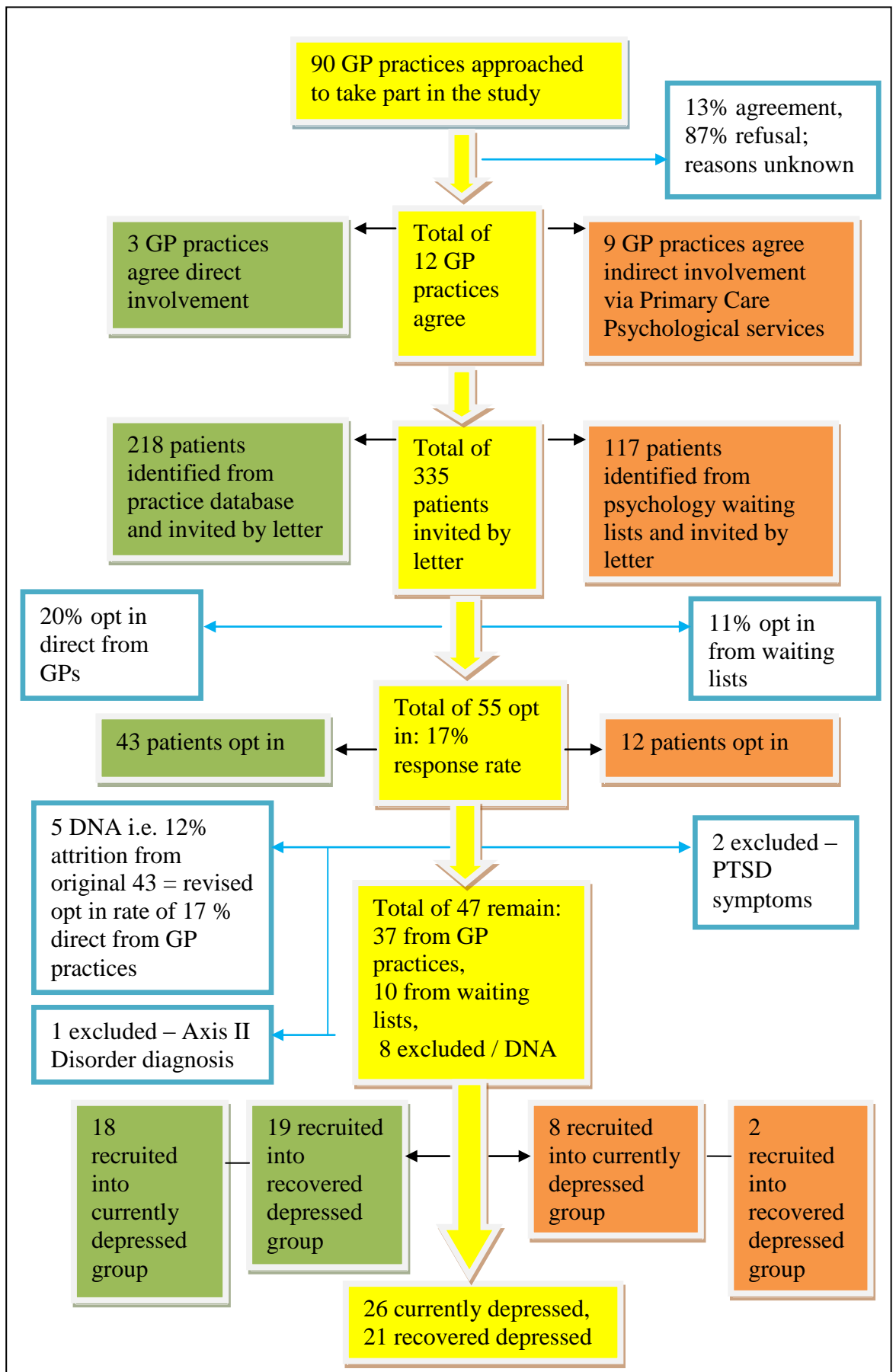
Table 2. Sample characteristics (N=74)

Group	Group 1 (N=26)	Group 2 (N=21)	Group 3 (N=27)
Taking antidepressants	20 (77%)	20 (95%)	0
Age of first onset of depression (years)			
- Mean (SD)	29.96 (12.74)	31.05 (11.97)	N/A
Number of depressed episodes			
- Mean (SD)	3.23 (2.55)	2.80 (2.75)	N/A
Time elapsed since last episode (months)			
- Mean (SD)	N/A	8.57 (11.25)	N/A

SD = standard deviation

Comparison of the currently depressed group and the recovered depressed group indicated that there were no significant differences between them in the number of depressed episodes experienced or in the age of first onset of depression.

Figure 1. Flow diagram of recruitment, response and attrition rates for clinical groups



3.2 Initial exploration of the data

At the first stage of analysis, data were analysed to detect any errors, outliers or missing values and explore statistical distribution. This was carried out through visual inspection of boxplots and histograms, and employment of distribution statistics for each dependent variable, for both the between-groups analysis and for a whole sample analysis. The dependent variables explored were depression symptoms (as measured by the CESD), rumination (as measured by the SRSQ), cognitive fusion (as measured by the CFQ13) and positive beliefs about rumination (as measured by the PBRs-A).

3.3 Between groups comparisons

3.3.1 Exploration of data for between groups analysis

Distribution was checked using the Kolmogorov-Smirnov test and all variables were found to be normally distributed, except for the CESD scores within both the recovered depressed group $D(21) = .193, p < .05$) and the never depressed group $D(27) = .207, p < .01$). As would be expected by the CESD selection criteria, values were skewed within these groups. However, as the CESD scores were not the subject of a between groups analysis, and variance amongst all other variables was sufficiently similar across the groups, it was concluded that assumptions for parametric analysis (for the between group tests) were met.

3.3.2 *Between groups analysis*

Hypothesis 1, 2 and 3 were explored by comparing the scores on each of the measures of rumination (SRSQ), positive beliefs about rumination (PBRs-A) and cognitive fusion (CFQ13) using a series of one-way analyses of variance (ANOVAs), with three independent groups (Group 1: currently depressed, Group 2: recovered depressed, Group 3: never depressed). The Levene Statistic was analysed for the Test of Homogeneity of Variances. It was found that the Levene Statistic was non-significant for all variables except for the SRSQ. For the SRSQ, a significant difference was found in terms of variance between groups ($F[2,71] = 5.46, p < .01$). As described by Field (2009), in cases such as this, where the assumption of homogeneity of variance is violated, a one-way ANOVA can still be applied but with the Welch F -ratio being reported for the SRSQ variable instead, as it controls the Type I error rate well.

Table 3 shows the mean scores and standard deviations for each measure.

Additionally, for each measure analysed in the between-groups comparison the F -statistics and p -values associated with these are also detailed. Significant group differences were found on measures of rumination (SRSQ: $F[2,71] = 110.549, p < .001$), cognitive fusion (CFQ13: $F[2,71] = 80.785, p < .001$) and positive beliefs about rumination (PBRs-A: $F[2,71] = 4.192, p < .05$). Please note that for the SRSQ, the Welch F -ratio is reported because the assumption of homogeneity of variance cannot be assumed here.

Table 3. Results by group

Measure	Group 1	Group 2	Group 3	F (df2,71)	Significance
	Mean (SD)	Mean (SD)	Mean (SD)		
Total CESD*	34.19 (10.48)	10.38 (4.28)	5.33 (3.27)	N/A	N/A
Total SRSQ	31.58 (4.26)	23.10 (6.62)	16.41 (2.99)	110.55 **	< .001
Total PBRs-A	26.54 (7.20)	24.76 (5.88)	21.3 (6.79)	4.19	< .05
Total CFQ13	68.77 (11.86)	41.05 (12.42)	30.52 (9.53)	80.79	< .001

* A score of 15 or more indicates clinical depression

** Welch *F* statistic *SD* = standard deviation

Games-Howell *post hoc* multiple comparisons allowed further exploration of where the significant group differences lay. Mean differences and significance values are detailed in table 4. This method was used as it does not rely on the assumption of equal variances and remains accurate when sample sizes are unequal (Field, 2009).

Results are as follows.

Hypothesis 1: Group differences in rumination

Post hoc comparisons revealed that mean rumination scores were significantly higher in the currently depressed group (M=31.58, 95% CI[29.86, 33.30]) than in both the recovered depressed group (M=23.10, 95% CI[20.08, 26.11]), $p < .001$, and the never depressed group (M= 16.41, 95% CI[15.22, 17.59]), $p < .001$. Also, mean rumination scores were significantly higher in the recovered depressed group (M=23.10, 95% CI[20.08, 26.11]) than the never depressed group (M= 16.41, 95% CI[15.22, 17.59]), $p < .01$.

These findings support hypothesis 1 in which it was predicted that participants who are currently depressed would report higher levels of rumination than participants who have recovered from depression, and that they would, in turn, report higher levels of rumination than participants who have never experienced depression.

Hypothesis 2: Group differences in positive beliefs about rumination

Post hoc comparisons revealed that positive beliefs about rumination scores were significantly higher in the currently depressed group ($M=26.54$, 95% CI[23.63, 28.44]) than the never depressed group ($M=21.30$, 95% CI[18.61, 23.98], $p < .05$). Comparisons between the recovered depressed group ($M=24.76$, 95% CI[22.08, 27.44]) and the other two groups were not statistically significant at $p < .05$.

These findings only partially support hypothesis 2 in which it was predicted that both participants who are currently depressed and participants who have recovered from depression would report higher levels of positive beliefs about rumination than participants who have never experienced depression. Significant group differences in the levels of positive beliefs about rumination held were only apparent between the currently depressed group and the never depressed group.

Hypothesis 3: Group differences in cognitive fusion

Post hoc comparisons revealed that cognitive fusion scores were significantly higher in the currently depressed group ($M=68.77$, 95% CI[63.98, 73.56]) than in the never depressed group ($M=30.52$, 95% CI[26.75, 34.29]), $p < .001$. Also, cognitive fusion scores were significantly higher in the recovered depressed group ($M=41.05$, 95% CI[35.39, 46.70]) than in the never depressed group ($p < .01$). Notably, there was

also a significant difference between the currently depressed group and the recovered depressed group ($p < .001$).

These findings support hypothesis 3, in which it was predicted both participants who are currently depressed and participants who have recovered from depression will report higher levels of cognitive fusion than participants who have never experienced depression.

Table 4. Games-Howell *post hoc* comparisons

Measure	Group		Mean Difference	Significance
SRSQ	Depressed	Recovered	8.482*	< .001
		Never	15.170*	< .001
	Recovered	Depressed	-8.482*	< .001
		Never	6.688*	< .01
	Never	Depressed	-15.170*	< .001
		Recovered	-6.688*	< .01
PBRS-A	Depressed	Recovered	1.777	.624
		Never	5.242*	< .05
	Recovered	Depressed	-1.777	.624
		Never	3.466	.152
	Never	Depressed	-5.242*	< .05
		Recovered	-3.466	.152
CFQ13	Depressed	Recovered	27.722*	< .001
		Never	38.251*	< .001
	Recovered	Depressed	-27.722*	< .001
		Never	10.529*	< .01
	Never	Depressed	-38.251*	< .001
		Recovered	-10.529*	< .01

*Significant mean difference

3.4 Whole sample analysis

3.4.1 Exploration of data for whole sample analysis

According to the Kolmogorov-Smirnov test, all variables were found to be significantly non-normal, apart from the PBRs-A. A positive skew was found for the distribution of both the CESD scores $D(74) = 0.2, p < .001$) and the CFQ13 scores $D(74) = 0.1, p < .1$). Bimodal distribution was found for the SRSQ scores $D(74) = 0.16, p < .001$). Log10 transformation was therefore carried out to normalise the dataset for the CESD, CFQ13 and SRSQ scores. Although this was successful for the CESD and CFQ13 scores, it was not for the SRSQ scores. Square root transformations, reciprocal transformations and reverse score transformations were also carried out on the SRSQ data without success. Due to the issue of data not conforming to the assumption of normality, a bootstrapping technique was used when carrying out multiple regression. This procedure is a robust method which can be used when assumptions about distribution of data have been violated (Field, 2009), thus reducing the danger of Type I error. Correlations between the predictor variables are presented in table 5 and results for the multiple regression are shown in table 6. The variables were all significantly correlated.

Table 5. Zero order correlation matrix

Variable	CESD (depression)	SRSQ (rumination)	PBRs (positive beliefs)
SRSQ	.79***		
PBRs	.23*	.40***	
CFQ13 (cognitive fusion)	.86***	.83***	.33**
* $p < .05$	** $p < .01$	*** $p < .001$	

3.4.2 Path analysis using multiple regression

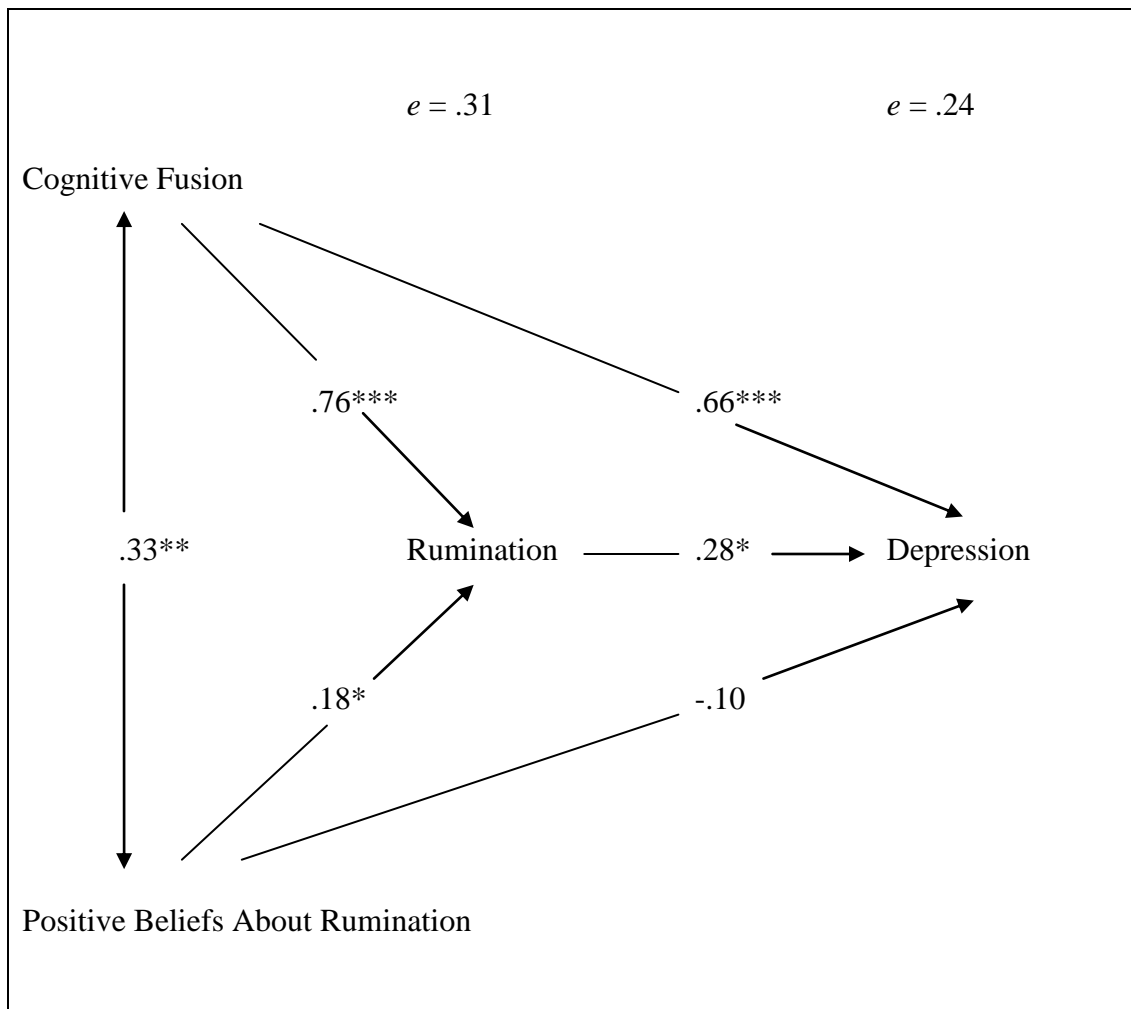
To explore further both the direct and indirect relationships between the variables, a path analysis was conducted using the multiple regression method suggested by Bramwell (1996). Although this technique cannot be used to infer causality, it can tell us how well a model fits the data by looking at the prediction of variance achieved. In the path model, the coefficients on the paths represent the relative strength of relationships between variables, whilst the sign of the coefficient indicates the direction of the relationship. These values are the standardised beta coefficients obtained from multiple regressions. See figure 2 for the path model.

Table 6. Multiple regression

	B	SE B	β
Step 1			
Constant (Depression)	-12.83	3.07	
Cognitive fusion	0.48	0.09	.66***
Rumination	0.52	0.23	.28*
Positive beliefs about rumination	-.21	0.12	-.10 (NS)
Step 2			
Constant (Rumination)	1.92	1.86	
Cognitive fusion	0.31	0.02	.76***
Positive beliefs about rumination	0.21	0.09	.18*
Step 3			
Constant (Cognitive fusion)	23.79	8.62	
Positive beliefs about rumination	0.96	0.33	.33**
B = Beta coefficient	* $p < .05$	** $p < .01$	*** $p < .001$
SE B = Bootstrapped standard error			
β = Standardised beta coefficient			
NS = Not significant			

Note: $R^2 = .76$ for Step 1, $\Delta R^2 = .69$ for Step 2, $\Delta R^2 = .11$ for Step 3

Figure 2. Path analytic model of relationships between cognitive fusion, positive beliefs about rumination, rumination and depression



* $p < .05$ ** $p < .01$ *** $p < .001$

Hypotheses 4 and 5: Exploration of the relationships between depression, rumination, positive beliefs about rumination and cognitive fusion

A comparison of the direct paths in the model reveals that cognitive fusion is a very strong predictor of rumination ($\beta = 0.76, p < .001$) and a very strong predictor of depression scores ($\beta = 0.66, p < .001$). This finding supports hypothesis 4 in which it was predicted that cognitive fusion would significantly predict both rumination and

depression symptoms. In addition, rumination is a predictor of depression symptoms ($\beta = 0.28, p < .05$), positive beliefs about rumination and cognitive fusion are correlated significantly ($\beta = 0.33, p < .01$), and positive beliefs about rumination and rumination are correlated significantly ($\beta = 0.18, p < .05$). In contrast, it is apparent from the model that the relationship between positive beliefs about rumination and depression symptoms is not significant ($\beta = -0.10, p > .05$).

To calculate the strength of an indirect pathway between two variables, the relevant path coefficients are multiplied. For example, the strength of the path from cognitive fusion, through rumination to depression ($0.76 \times 0.28 = 0.21; p < .05$) is significant. However, it is noted that the direct relationship from cognitive fusion is stronger than this moderated relationship (.66 versus .21). In contrast, the strength of the path from positive beliefs about rumination, through rumination to depression ($0.18 \times 0.28 = 0.05; p > .05$) is not significant. With regard to hypothesis 5, this finding suggests greater support for the predictions made by the ACT model than by the MCT model: The relationship between cognitive fusion, rumination and depression has been found to be stronger than the relationship between positive beliefs about rumination, rumination and depression.

The strength of the indirect path from positive beliefs about rumination, through cognitive fusion and rumination to depression ($0.33 \times 0.76 \times 0.28 = 0.07; p > .05$) is also not significant. Similarly, the indirect path from cognitive fusion, through positive beliefs about rumination and rumination to depression ($0.33 \times 0.18 \times 0.28 = 0.01; p > .05$) is not significant. This indicates that although cognitive fusion and positive beliefs about rumination are correlated (as depicted by the strength of the

direct path between them), they do not share a lot of variance in accounting for the presence of either rumination or depression.

Of particular note in the path analysis is the final error term for prediction of depression from the whole model, ($1 - R^2: e = 0.24$). This means that 76% of the variance in depression symptoms is accounted for by the variables included in the full model. Overall, the path model suggests that cognitive fusion does show a significant association with depression and with rumination. However, it is understood that these are statistical associations and that this research design cannot infer causality.

3.5 Concerns Over Conceptual and Measurement Overlap

In order to address any potential concerns about the risk of conceptual overlap between the rumination measurement (SRSQ) and the cognitive fusion measurement (CFQ13), a further analysis of the full cognitive fusion scale (CFQ28) was carried out. According to the definitions of rumination and cognitive fusion explored in the introduction, rumination is about the frequency of having certain types of content specific thought, whereas cognitive fusion is about the degree to which thoughts are seen as reasons for action, taken as meaningful or significant about the self, or experienced as difficult to distance the self from. In order to reduce any confounds in the measure between cognitive fusion and rumination, all of the items of the full scale CFQ28 were checked for face validity. Any items which appeared to tap into the content of thoughts or items, or which could be interpreted as definitions for rumination rather than fusion (such as ‘I get very focussed on my distressing

thoughts), were excluded. In total, fourteen of the twenty-eight original items were excluded. A full list of the items included and excluded from the adapted CFQ is given in table 7.

It is of note that only seven of the remaining items in this adapted version of the CFQ are also present in the shortened CFQ13, which was used in the previous analysis.

The remaining seven items are not included in the CFQ13. As the full scale CFQ28 had been administered with participants, it was possible to extract data for the amended version of the CFQ. This new scale, using different items, remained reliable ($\alpha = .902$).

The direct and indirect relationships between the variables were explored again with a path analysis using the multiple regression method suggested by Bramwell (1996), and hypotheses 4 and 5 were re-examined.

Table 7. Items included and excluded from adapted Cognitive Fusion Scale.

Items included	Items excluded
I tell myself I shouldn't be thinking the way I'm thinking	My thoughts cause me distress or emotional pain
Even when I am having distressing thoughts, I know that they may become less important eventually*	I find myself preoccupied with the future or past
I make judgements about whether my thoughts are good or bad	I get upset with myself for having certain thoughts
Even when I am having distressing thoughts, I can see that those thoughts may not be literally true*	I tend to get very entangled in my thoughts
I feel like my thoughts need to change before I can have a good life	I feel upset when I have negative thoughts about myself
I find it easy to view my thoughts from a different perspective*	I get very focussed on distressing thoughts
I think some of my thoughts are bad or inappropriate	It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful
I can watch my thoughts from a distance without getting caught up in them*	My thoughts distract me from what I'm actually doing
It is ok to have inconsistent thoughts on the same subject*	I over-analyse situations to the point where it's unhelpful to me
It's possible to have negative thoughts about myself and still know that I am an ok person*	I struggle with my thoughts
I am able to do what's important in my life even when I am having upsetting thoughts*	Once I've thought about something upsetting it's difficult for me to focus on anything else
I can do difficult things even if my thoughts say they are impossible to do.*	I tend to react very strongly to my thoughts
I can be aware of my thoughts without necessarily reacting to them*	I get so caught up in my thoughts that I forget what I am actually doing
I need to control the thoughts that come into my head	I get so caught up in my thoughts that I am unable to do the things I most want to do

*Reverse scores used for these items

3.5.1 Exploration of data for whole sample re-analysis

The Kolmogorov-Smirnov tests demonstrated normal distribution for the amended CFQ scores (CFQ-A). However, as previously noted, distribution of CESD and SRSQ scores were not normal. Again, due to the issue of data not conforming to the assumption of normality, a bootstrapping technique was used when carrying out the multiple regression, in order to reduce the risk of Type I errors. Correlations between the predictor variables are presented in table 8 and results for the multiple regression are shown in table 9. As demonstrated, the variables were all significantly correlated.

Table 8. Zero order correlation matrix

Variable	CESD (depression)	SRSQ (rumination)	PBRS (positive beliefs)
SRSQ	.79***		
PBRS	.23*	.40***	
CFQ-A (cognitive fusion)	.82***	.81***	.29**

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 9. Multiple regression using amended CFQ items

	B	SE B	β
Step 1			
Constant (Depression)	-17.67	3.70	
Cognitive fusion - amended	0.40	0.09	.53***
Rumination	0.40	0.24	.38**
Positive beliefs about rumination	-0.16	0.15	-.07 (NS)
Step 2			
Constant (Rumination)	1.92	1.80	
Cognitive fusion - amended	0.31	0.02	.76***
Positive beliefs about rumination	0.21	0.09	.18*
Step 3			
Constant (Cognitive fusion) - amended	34.27 0.79	7.90 0.30	.28*
Positive beliefs about rumination			

* $p < .05$ ** $p < .01$ *** $p < .001$

B = Beta coefficient

SE B = Bootstrapped standard error

β = Standardised beta coefficient

NS = Not significant

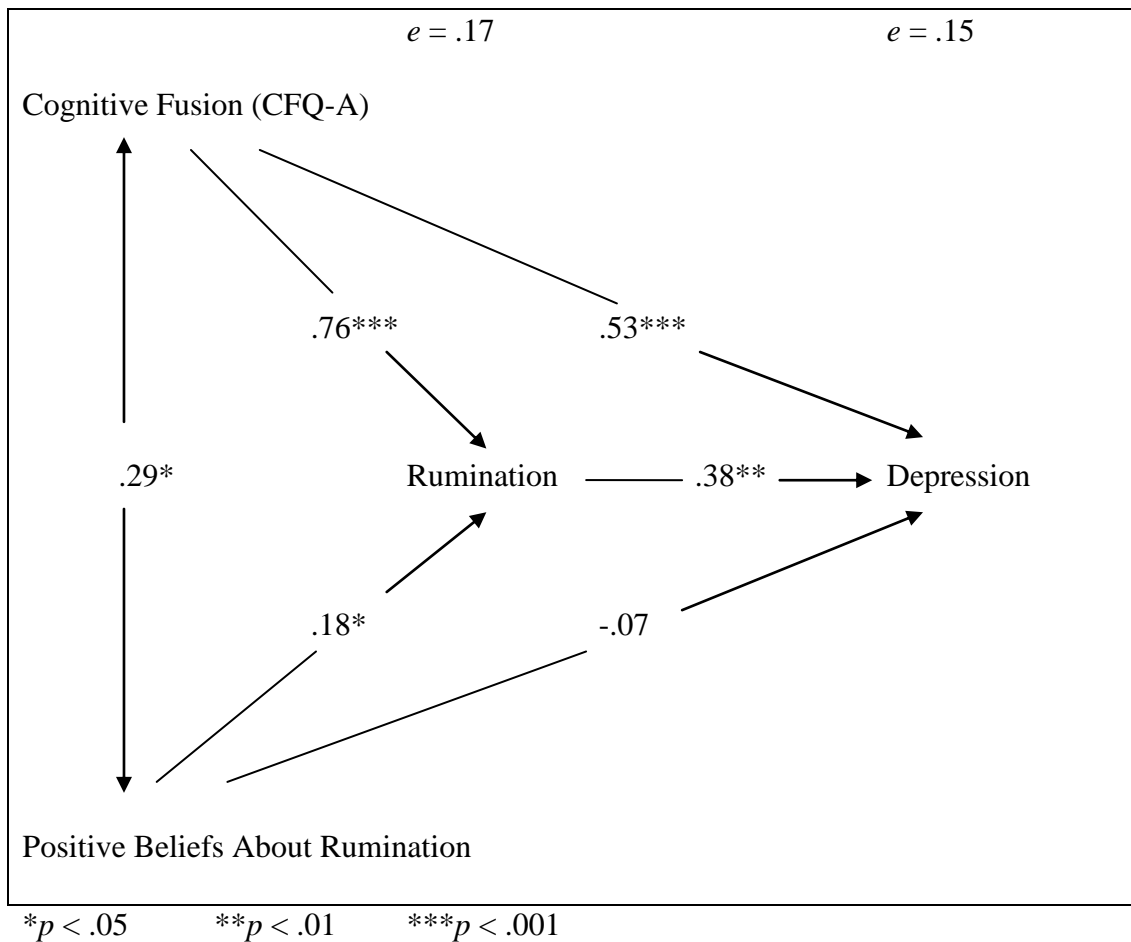
Note: $R^2 = .85$ for Step 1, $\Delta R^2 = .83$ for Step 2, $\Delta R^2 = .08$ for Step 3

3.5.2 Path analysis using multiple regression

The path model can be seen in figure 3. Of note in the path analysis is the final error term for prediction of depression from the whole model, ($1 - R^2: e = 0.15$). This means that 85% of the variance in depression symptoms is accounted for by the variables included in this full model which incorporates amended CFQ scores. This,

along with substantively similar relationships between variables (as expressed by the similar standardised beta coefficients between the variables), denotes a relatively similar model fit as the one depicted previously in figure 2.

Figure 3. Path analytic model of relationships between cognitive fusion (amended items), positive beliefs about rumination, rumination and depression



Again, the path model suggests that cognitive fusion does show a significant association with depression and that the impact of cognitive fusion upon depression severity is moderated by the presence of rumination. However, it is understood that these are statistical associations and that this research design cannot infer causality.

Hypotheses 4 and 5: Re-exploration of the relationships between depression, rumination, positive beliefs about rumination and cognitive fusion

A comparison of the direct paths in the new model reveals that cognitive fusion remains a very strong predictor of rumination ($\beta = 0.76, p < .001$) and a very strong predictor of depression scores ($\beta = 0.53, p < .001$). This finding therefore continues to support hypothesis 4 in which it was predicted that cognitive fusion would significantly predict both rumination and depression symptoms. In addition, rumination remains a predictor of depression symptoms ($\beta = 0.38, p < .01$). The direct relationships between all other variables remain substantively the same, with positive beliefs about rumination being significantly correlated with cognitive fusion ($\beta = 0.28, p < .05$) and rumination ($\beta = 0.18, p < .05$) but not with depression symptoms ($\beta = -0.07, p > .05$).

In terms of indirect pathways between the variables, the strength of the path from cognitive fusion, through rumination to depression ($0.76 \times 0.38 = 0.28; p < .05$) is slightly strengthened within this new model. The strength of the path from positive beliefs about rumination, through rumination to depression ($0.18 \times 0.38 = 0.07; p > .05$) remains non-significant. Again, findings regarding hypothesis 5 remain the same, with greater support for the predictions made by the ACT model than by the MCT model: The relationship between cognitive fusion, rumination and depression is stronger than the relationship between positive beliefs about rumination, rumination and depression.

Finally, it is of note that with this re-analysis the final error term for prediction of depression from the whole model, ($1 - R^2: e = 0.15$). This means that 85% of the

variance in depression symptoms is accounted for by the variables included in this model. This is an increase from the already large prediction of variance of 76% accounted for by the previous model. However, again it must be emphasised that these are statistical associations and that this research design cannot infer causality.

In conclusion, the secondary analysis goes some way to addressing a possible critique that the cognitive fusion measure (CFQ) and rumination scale (SRSQ) are measuring the same thing.

Chapter 4: Discussion

4.1 Summary of findings

This study examined differences in cognitive fusion and positive beliefs about rumination between currently depressed, recovered depressed and never depressed controls. As predicted, significant group differences were found, between all three groups, in levels of rumination and cognitive fusion. Currently depressed participants endorsed significantly higher levels of rumination and cognitive fusion than recovered depressed participants who, in turn, endorsed significantly higher levels than never depressed participants. However, contrary to expectation and to a previous research finding (Watkins & Moulds, 2005), group differences in positive metacognitive beliefs about rumination were only found between the currently depressed and never depressed groups. No significant differences were found between either of these groups and the recovered depressed group in level of endorsement of positive beliefs about rumination i.e. the scores of those who were recovered depressed were between the two extreme groups and similar to both.

An analysis of the whole sample revealed significant overall correlations between each of the variables, i.e. cognitive fusion, positive beliefs about rumination, rumination and depression, with only the relationship between positive beliefs about rumination and depression being non-significant. In comparing the strength of the direct and indirect relationships or paths between the variables, it was found that the strongest direct paths were between cognitive fusion and rumination, and cognitive

fusion and depression. Interestingly, a significant correlation between cognitive fusion and positive beliefs about depression was also found.

The strongest indirect path was between cognitive fusion, rumination and depression, though this did not exceed the strength of the direct paths between these three variables. The indirect path between positive beliefs about rumination, rumination and depression was not significant. These findings support the proposal that cognitive fusion could be a fruitful process to target in treatment studies.

Finally, the path analyses indicated that a high proportion of the variance in depression symptoms (i.e. over 75 per cent) within the whole sample could be accounted for by the variables in the model i.e. rumination, cognitive fusion and positive beliefs about rumination. This was the case for both the analysis using the standard cognitive fusion measure, and the re-analysis using the adapted cognitive fusion results.

4.2 Interpretation of findings

4.2.1 Presence of cognitive fusion and links with rumination

Overall, it would seem from this study that people who have recovered from depression (but not received any cognitive and/or behavioural psychological treatment), experience raised levels of rumination and cognitive fusion in comparison to people who have never experienced depression. So, even though they are no longer clinically depressed, a difference in cognitive processes remains. Indeed, both

diagnostic interviews and scores on the depression symptoms measure (CESD) demonstrated that those in the recovered depressed group were no longer experiencing a depressive disorder. This may indicate that cognitive fusion is not secondary to depression and does appear to be implicated in the ruminative process. However, further studies using larger sample sizes and a prospective longitudinal design are required to draw more firm conclusions about this. Within this study, the relationship between cognitive fusion and rumination, found within the overall sample, was stronger than any of the other relationships between the other variables tested. This provides some support for the suggestion that cognitive fusion be considered in the conceptualisation of ruminative processes and depression.

Within ACT and the RFT framework, it is proposed that rumination is a cognitive ‘reason-giving’ strategy and that the more fused a person is with their thoughts, the more they will implement such strategies. Rumination is therefore a thinking style which is adopted in response to cognitive fusion. It is for this reason that the ordering of the variables was chosen in the path model presented (rather than, for example, placing them with cognitive fusion as the moderator between rumination and depression). This abstraction was chosen as it reflected the direction of the relationships between variables as described by the literature. However, it is also possible that the relationship between these two processes is bi-directional, and cognitive fusion also occurs in response to ruminative thinking. Indeed, the direction of the relationship between these two variables cannot be determined by this study. Path analysis can evaluate correlational hypotheses but cannot establish the direction of causality. However, the results do support the proposal that a relationship exists

between these two processes, with the effect size for this relationship being large ($d=2.98$).

It is understood that some caution must be given to the finding within this study of a strong relationship between cognitive fusion and rumination: it is possible that this is a product of construct and measurement overlap. As discussed earlier, within the literature about these cognitive processes, clear differences are indicated at the level of definition. Rumination is defined as a perseverative, self-evaluative, negative thought process focused on mood, symptoms, and past regrets or perceived failures. In other words, rumination, as well as describing a type of repetitive thought process, is content specific. The SRSQ, which is the self-report measure of rumination used in this study, certainly appears to define rumination in this way, as it measures the self-reported frequency of having certain content specific thoughts. In contrast, within the literature reviewed, cognitive fusion is defined as a process in which people see thoughts as reasons for action, view thoughts as facts, see themselves as defined by (as opposed to separate from) their thoughts, and get caught up in their thoughts, struggling to distance themselves from them. In other words, fusion is context specific: it refers to the *relationship* people have with their thoughts. The CFQ, which is the self-report measure of cognitive fusion used in this study, defines cognitive fusion in this way. Responders are asked to rate items about their relationship with their thoughts generally, rather than any particular thought content. It would therefore appear that, at the level of definition of the constructs which these scales purport to measure, overlap cannot explain why these measures correlate so highly.

However, in order to fully address this possibility of confounds between measures, it was necessary to analyse the CFQ in terms of face validity. Analysis of item wording within the cognitive fusion measure highlighted that some items could potentially be argued to have confounds with general definitions of rumination. For example, items such as ‘I find myself preoccupied with the future or past’ could be interpreted as partly defining the type of thought content associated with rumination. By excluding any items from the full scale CFQ28 which potentially had confounds with rumination (13 items were excluded in total), and re-analysing the data, it was anticipated that criterion contamination would be reduced. This new scale had a Cronbach’s $\alpha = .902$, indicating that even with the change in items it remains meaningful. The finding that the strength of correlations between rumination and cognitive fusion were very similar in this re-analysis, with an effect size of $d=2.76$ further supports the proposal that the correlation between cognitive fusion and rumination is not simply due to measurement overlap.

The final possibility remains that there is *conceptual* overlap between rumination and cognitive fusion. For example, it is possible that the SRSQ and the CFQ are simply measuring different aspects of the same construct, with entanglement/fusion being a part of what distinguishes rumination from ‘non-ruminative’ thought processes, alongside the content and frequency of the thoughts. In this sense, the definitions of rumination which prevail within the literature, which have largely been developed from Nolen-Hoeksema’s (1991) response styles theory, may not fully describe the ruminative process. Furthermore, the response styles questionnaire (from which the SRSQ originates) may not in essence be measuring the full ruminative construct, and may only be tapping into a specific component of this construct. Already, the SRSQ

has been criticised in terms of content validity, for being heavily biased by depressive symptoms: it is suggested that the scale does not purely measure a specific thought process, as items regarding symptom-based rumination are more related to previous symptoms of depression than to rumination (Conway *et al.*, 2000). It has also been criticised for its overlap with the Beck Depression Inventory (BDI; Beck *et al.*, 1979) and conceptual overlap with negative automatic thoughts has been suggested (Conway *et al.*, 2000). This is of note, as this is the measure which prevails within research on rumination. However, this view has been challenged by studies which have found rumination as measured by the ruminative response scale questionnaire do predict depression even when negative cognitions are controlled, thus suggesting the constructs do not wholly overlap (e.g. Spasojevic & Alloy, 2001). Clearly, the question of whether the process of rumination is captured in its entirety by measures such as the SRSQ remains open to debate. It will therefore be necessary to consider future tangible research designs which could disambiguate the two processes of rumination and fusion in order to clarify whether they are distinct or if a problem exists with the definition of rumination, at the level of theory. This will be discussed further in section 4.6.

4.2.2 Presence of positive beliefs about rumination and links with rumination

The finding that participants with depression endorsed more positive metacognitive beliefs about rumination than participants without depression was in keeping with

previous studies which have compared these two groups. Within this study, the effect size for this group difference was $d=0.75$, which was smaller than in the only other study which has compared similar groups using the same adapted PBRs-A measure of positive beliefs (Watkins & Moulds, 2005, $d=1.1$). However, the overall relationship found in the current study between rumination and such metacognitive beliefs was of similar effect size as previously found i.e. $d= 0.87$ as compared to $d=0.97$ found by Watkins and Moulds (2005). Interestingly, Papageorgiou and Wells (2003) found differing effect sizes for the correlation between PBRs score and rumination score depending on the type of group used. They reported effect sizes of $d=0.65$ for a large group of currently depressed individuals and $d=1.42$ for a large non-clinical group. It would appear that the strength of the correlation between positive beliefs and rumination is affected by depression severity. Overall, the correlation found within this current study between positive beliefs about rumination and levels of rumination supports the proposal that such beliefs are present in people who ruminate. Yet, the lack of significant difference in levels of endorsement of positive beliefs between the currently depressed group and the recovered depressed group indicates that the further claim that positive beliefs about rumination contribute to the development of rumination cannot be supported. If this were the case, a significant difference in this group would be anticipated, as it is known that recovered depressed patients are prone to rumination. It is of note that this finding was not consistent with the one other study which has compared these three groups (Watkins & Moulds, 2005). In Watkins and Moulds' (2005) study, the original positive beliefs about rumination scale (PBRs) and an adapted version (PBRs-A) were both used with all participants. Unlike the original measure, the adapted

version makes no reference to either rumination or depression. In Watkins and Moulds' study, differences in PBRs-A score between the never depressed group and the recovered depressed group were significant ($p < .001$; effect size $d = 1.09$), as compared to this study in which differences between these groups were not ($p > .05$; effect size $d = 0.54$). Differences in the findings of this previous study and the current study regarding the between groups differences for PBRs-A score may be accounted for by the small sample size, which may have led to a Type II error. With larger groups, the effect size may have been significant at the .05 level. Further replication of the study with larger groups would clarify this matter.

Another reason for the differences in findings may be due to the current study implementing only one measure of metacognitive beliefs about rumination. Watkins and Moulds (2005) study may have suffered from some measurement contamination due to all participants completing both measures: the PBRs and the PBRs-A. Although the item wording has been amended in the PBRs-A, with the word 'ruminating' being substituted for 'thinking', and 'my depression' being substituted with 'my feelings', the items still resemble each other. For example, the item 'Thinking about the past helps me to prevent future mistakes and failures' remains similar to 'Ruminating about the past helps me to prevent future mistakes and failures'. Participants may have attempted to respond to both apparently similar questionnaires in a consistent manner, thus appearing to strengthen the relationship between these two measures and, in turn, strengthening the relationship found in Watkins and Moulds' (2005) study between the PBRs-A and depression. In effect, the study's attempt to reduce criterion contamination may have been impaired through its methodology and responder bias, and this current study's findings may be

a more accurate representation of the relationship between the PBRs-A and depression. A replication of the study using a larger sample but with three similar groups, and the PBRs-A without the PBRs is necessary to clarify this issue.

4.2.3 Links between cognitive fusion and positive beliefs about rumination

It is of note that a significant correlation between positive beliefs about rumination and cognitive fusion was found. Furthermore, the relationship was maintained even when adapted cognitive fusion data (in which items which were ‘rumination-like’ were removed) was included in the re-analysis. However, positive beliefs and cognitive fusion do not share a lot of variance in accounting for the presence of either rumination or depression. This finding supports the suggestion that although the theoretical models from which these constructs arise differs, both appear to be implicated in some way in ruminative processes. However, it remains unclear, due to the limitations of the current study design, to determine whether the relationship between cognitive fusion and positive beliefs about rumination is direct, or is the result of other mutual variables. For example, it is proposed by the RFT model that reason-giving is itself a component of ruminative thought. Metacognitive beliefs are also defined as a type of reason-giving for rumination. The relationship found between cognitive fusion and positive beliefs about rumination may therefore simply reflect the relationship between cognitive fusion and rumination, with reason-giving being the mutual variable. Another possibility is that, as suggested earlier, cognitive

fusion may be a component of a more comprehensive definition of rumination than that which is currently proposed at the level of theory. In this case, the relationship between positive beliefs about rumination and cognitive fusion may simply be accounted for by the already established relationship between positive metacognitive beliefs and rumination. As discussed already, it is clear that future research is required to clarify whether cognitive fusion and rumination are separate, distinct, constructs.

It is acknowledged that interpretations of the data are somewhat speculative and, at this stage, we can only assume that rumination, cognitive fusion and positive beliefs about rumination are involved in depression, and that the model of these relationships which was chosen to test is supported by the data. This is supported by the overall path analysis findings that a high proportion of the variance in depression symptoms within the whole sample could be accounted for by the presence of these variables in the model. However, the results also indicated that, at the level of data fit, depression severity was best predicted by rumination and cognitive fusion rather than positive beliefs about rumination.

4.3 Strengths and limitations of project

The current study is limited by using a relatively small sample, although it did have adequate power to detect the effects reported. However, a particular strength of this study was the inclusion of a clinical sample rather than simply using a non-clinical sample of higher frequency and lower frequency ruminators. In their meta-analytic

review, Aldao *et al.* (2010) found that sample type was a significant moderator of problem solving, rumination, avoidance and suppression, with studies which included clinical participants showing stronger relationships between these variables and psychopathology, than in studies without clinical participants. They concluded that the relationship between dispositional emotion-regulation strategies, such as rumination, and psychopathology may be stronger when more extreme groups are compared. Furthermore, they suggested that this difference may be because non-clinical populations are more likely to move flexibly between emotion-regulation strategies, and that this skill of flexibility is at least as important as the use of any one strategy in determining psychopathology (Aldao *et al.*, 2010). Therefore, studies which use only non-clinical populations would be less representative of the processes which take place in maintaining psychopathology, due to potential effects of psychological inflexibility being excluded.

A particular strength of this study was the method by which groups were selected. All participants were screened using a clinical interview and a measure of depression symptomatology (CESD), which confirmed the 'level of caseness' i.e. those in the recovered depressed group had been screened both through a diagnostic interview as no longer meeting criteria for MDD, and had scores on the CESD lower than the clinical depression cut-off of fifteen points. This screening method provided certainty that distinct groups were being compared.

Furthermore, the clinical sample recruited was typical of UK National Health Service Primary Care patients, and the results can therefore be relatively easily generalised to other similarly psychologically disordered individuals. In addition, the inclusion of a

recovered depressed group who had not received any cognitive and/or behavioural psychological interventions in their treatment meant that conclusions drawn about the levels of rumination, positive beliefs about rumination and cognitive fusion in this group, as compared to the never depressed group, could be assumed to be unrelated to any specific interventions targeted at such processes.

The use of self-report measures within this study must also be considered as a potential limitation. Although use of these measures allowed for an initial exploration of the relationship between rumination, cognitive fusion and positive beliefs about rumination, the extent to which individuals can accurately self-report on their emotion regulation strategies (such as rumination) has been questioned (Robinson & Clore, 2002). It may be the case that responding accurately to self-report measures simply requires higher levels of insight and metacognition than all individuals are capable of. Responses may be influenced by negative moods or self-presentation biases, and responders may confound the experience of emotion with its regulation (Cole *et al.*, 2004).

Furthermore, the use of a retrospective questionnaire assessment within this study may also be a weakness. The SRSQ requires participants to make retrospective reports on their responses to depressed mood, by asking them to self-rate how they respond at times when they feel low. Retrospective assessment is known to be particularly vulnerable to bias and distortion (Stone *et al.*, 1998). However, the cognitive fusion measure and the positive beliefs about rumination measure are not retrospective and so are less vulnerable to such criticism. Indeed, the results of the study clearly suggest that these processes are more prevalent in individuals with

depression. A limitation of the study is that it cannot investigate how these processes interact with ruminative thinking moment to moment, in real-time settings, in response to experiences and mood fluctuations as they happen. Future experimental studies into these processes, conducted in every-day settings, may therefore be more informative (Moberley & Watkins, 2008).

Indeed, from an ACT perspective there may philosophically be questions around the use of psychometric techniques per se within a behavioural approach which describes itself as 'functional contextual'. The use of questionnaires cannot account for the environments and contexts in which the behaviours measured occur. However, it could be argued that what is being measured is the behaviour of the individual reporting on their sense of how true each statement is about their own behaviour. In the example of responding to items within the cognitive fusion questionnaire, this is a proxy for actually measuring the individual overanalysing situations to the point where it is unhelpful to them. Again, future experimental or diary studies may be beneficial. However, problems within such alternative study designs would also have to be considered. For example, it has been found that within experimental studies in which participants are instructed to use specific strategies such as rumination, some participants have great difficulty in doing so, and findings may therefore be biased by such difficulties (Demaree *et al.*, 2006).

A final obvious limitation of this study is in the use of a cross-sectional design and the subsequent use of a multiple regression path model in analysing the overall relationships between the variables. Within a given path diagram, path analysis can highlight more significant paths and can indicate, between two correlational

hypotheses, which path is best supported by the data, according to the relative sizes of path coefficients. However, the analysis remains associative and definitive statements about causality cannot be made. Furthermore, path analysis cannot tell us whether there is a mutual dependence on other unknown variables, i.e. variables that are not included in the initial study or analysis. The results of this study have therefore been interpreted with caution. However, it is apparent that the evidence presented in this study strongly supports the presence of these cognitive processes in the experience of depression, as demonstrated by the overall level of variance in depression symptoms which is accounted for by the variables included in the path model.

4.4 Theoretical implications

Perhaps the most important theoretical contribution of this study is the finding that cognitive fusion in particular appears to play a significant role in both rumination and depression. This finding supports the proposal by ACT that cognitive fusion is implicated in psychopathology (Hayes, 2004). Furthermore, the data fit for the level of variance in depression symptoms which was accounted for by the variables of rumination, positive beliefs about rumination, and cognitive fusion was high. This warrants further exploration.

4.4.1 Understanding the role of thought content and thought context in depression

The measure of rumination used in this study has already been discussed as being content-specific, tapping into the frequency with which particular depression-specific thoughts are experienced, whereas the measure of cognitive fusion is concerned with the process issue of an individual's relationship to their thoughts. Interestingly, it is the shifting emphasis from treatment interventions focussing on thought content to interventions focussing on thought process which has occupied more recent developments within psychological therapy. This is apparent both within mindfulness and acceptance based therapies, such as acceptance and commitment therapy (ACT) in which techniques aimed at cognitive defusion are used, and within cognitive therapies, such as metacognitive therapy (MCT) in which techniques aimed at changing underlying metacognitive beliefs about rumination are used. It is apparent within various theoretical accounts that the interplay between content and process is crucial in the understanding of psychopathology. In the case of depression, the findings of this study support the suggestion that an important aspect of this interplay is between depression-specific ruminative thinking and cognitive fusion.

4.4.2 Understanding the role of cognitive fusion and positive beliefs about rumination in rumination and depression

From a metacognitive perspective, the S-REF model (Wells & Matthews, 1994, 1996) does not explicitly detail why a person's relationship with their ruminative thoughts (e.g. cognitive fusion) would be implicated in depression. However, it is possible that cognitive fusion is implicated in several of the activities which are collectively known as the cognitive-attentional syndrome (CAS), which is suggested by the S-REF model to contribute to emotional disorder and relapse. Some of the activities within this CAS, such as attentional bias and reduced efficiency of cognitive functioning, could also be argued to be supported by, or consequences of, cognitive fusion. Because activation of metacognitions is also a component of the CAS, the relationship between cognitive fusion and metacognitions may be explained by the S-REF model's proposal that all such processes are involved in emotional disorder, such as depression. In other words, the relationship between cognitive fusion and positive beliefs about rumination is not direct but is the result of other mediating or moderating variables. Therefore, although not addressed by the S-REF model, the implication of cognitive fusion in rumination and depression is not entirely incompatible with the model.

From an ACT perspective, the role of cognitive fusion and positive beliefs about rumination in accounting for a large proportion of the variance in depression symptoms within this study may be accounted for by the ACT proposal that fusion is related to 'reason-giving' processes. Positive beliefs about rumination, as defined by both the PBRS and PBRS-A items, are forms of reason-giving: not for depression,

but for a particular thinking style. It is proposed by ACT that reason-giving is itself a component of ruminative thought (Zettle, 2007). From an ACT perspective, the relationship found in this study between cognitive fusion and positive beliefs about rumination may be indirect, with reason-giving being the mutual variable.

Again it is acknowledged that such interpretations are speculative. However, the above models suggest a range of testable hypotheses which could be explored in future studies.

4.5 Clinical implications

4.5.1 Assessment of cognitive fusion and beliefs about rumination

The results of this study suggest that routine enquiry regarding the beliefs people hold about their thinking style, particularly rumination, and the level of fusion they have with their thoughts should be integrated into the psychological assessment of those experiencing depression. In doing so, it may be possible to target interventions towards factors which are potentially implicated in rumination. Given the literature reviewed regarding the role of rumination in the onset, maintenance and recurrence of depression, it is predicted that treatments that alter rumination would have a large effect on mood and future outcome.

4.5.2 Cognitive fusion interventions

Furthermore, given the finding of this study of a strong correlation between cognitive fusion and rumination and cognitive fusion and depression, it seems possible that strategies impacting on one will also impact on the other. It has been suggested that an experiential type of self-focused attention, rather than an analytic perseverative type, is a more useful activity for people experiencing depression (Watkins & Teasdale, 2001, 2004). It is possible that addressing cognitive fusion may promote this more experiential self-focus.

As previously described, cognitive defusion techniques are a central part of ACT interventions. Techniques which address defusion are intended to create a ‘de-fused’ perspective on psychological content, reducing entanglement with thoughts and promoting the perception that “I am not my thoughts”. However, as discussed, empirical evidence regarding the effectiveness of these specific approaches is limited. The findings of this study highlight that further laboratory based research which evaluates cognitive defusion interventions is warranted.

4.5.3 Metacognitive interventions

The use of techniques to address underlying metacognitions which support rumination already forms a component of MCT for depression. Within MCT it is proposed that in altering such metacognitions, the use of rumination is reduced which, in turn, reduces depression. However, component analysis of the precise role

of changing metacognitions in reducing rumination has not yet been carried out and empirical evidence regarding the effectiveness of approaches which specifically target metacognitions are also limited. In addition, the results of this study suggest that efforts to modify positive metacognition about rumination may be relatively less effective as a treatment for depression than the development of defusion based strategies. However, replication of this study with larger samples is required before any firm conclusions can be made regarding the relative roles of cognitive fusion and metacognition in rumination and depression. Again, it is also clear that further laboratory based research which evaluates interventions targeting metacognition is warranted.

4.5.4 Potential clinical incompatibility

It is important to highlight that although both cognitive fusion and metacognitive beliefs are indicated within the current study on rumination, an integrative approach to clinical intervention is not necessarily advised. The theoretical models underpinning ACT approaches and MCT approaches are different and although some potential overlap has been highlighted, the models do not necessarily support the use of different clinical interventions. For example, it is proposed within RFT, which underpins ACT, that attempts to change key nodes in cognitive networks is counter-productive as it creates a context that tends to elaborate the network in that area and increase the functional importance of these nodes (Barnes-Holmes, 2004). In other words, using verbal challenging and restructuring of underlying metacognitions

which support rumination, may be counter-productive as they would ultimately serve to elaborate unhelpful verbal processes i.e. they would make control of thoughts as a method for controlling emotion and behaviour more central, resulting in individuals becoming more ‘stuck’ or ‘fused’, rather than less. This suggests that within an ACT treatment model, it is preferable to focus on the *function* of cognitive networks rather than the *content* of them, in clinical interventions. Again, this is an area of debate which is ongoing and it is likely that, until further clarity is brought about by both outcome studies and component analysis studies, it is the preference of the patient and the therapist which will determine whether interventions which target rumination that are grounded in one model are selected over another.

4.6 Future research directions

4.6.1 Cognitive fusion research

It is apparent that a wide range of research questions remain to be answered and the possibilities for developing on the work of this study are numerous. In the first instance, it is of note that this is the first study exploring the role of cognitive fusion (rather than just ‘believability of thoughts’) in rumination and depression. As such, similar studies using larger sample sizes are needed to provide support for the findings of the study that cognitive fusion, as measured by the CFQ, is related to depression. Furthermore, future studies with prospective longitudinal designs are needed to establish the temporal relationships between cognitive fusion, rumination and depression. That is, to clarify whether individuals with pre-existing high levels

of cognitive fusion are more likely to engage in rumination when depressed, or whether individuals with pre-existing high levels of rumination are more likely to become more fused with their thoughts when depressed.

In order to disambiguate between the two processes of rumination and fusion, experimental studies using the rumination induction developed by Nolen-Hoeksema and Morrow (1993), could be carried out. This would allow the researcher to instigate rumination in participants and then assess the degree of cognitive fusion produced. A comparison between participants who had undergone a prior positive mood induction versus a negative mood induction could be made. It may be that cognitive fusion and rumination are synonymous, or that they are distinct processes which overlap. Regardless, further exploration is warranted. As stated by Raes and colleagues (2008): ‘...distinguishing different components in rumination is of great importance in furthering our understanding of the precise relationship between rumination and depression and the mechanisms underlying this association’ (p.538.). Such experimental studies may also help to disentangle the causal relationship between fusion and rumination. It is proposed that if they are separate constructs, it would be possible to alter the level of cognitive fusion whilst, in the short term, the level of rumination remains the same. Another potential study design would be to compare two groups of high or low ruminators. Similar to Moulds and colleagues’ (2010) experimental study on rumination, one of three possible conditions could then be applied across both groups: a laboratory-based stressor involving negative feedback on a forced-failure anagram task, positive feedback on the task, or no feedback on the task. Baseline measures of cognitive fusion could be taken and it

could then be observed whether those with higher baseline levels of fusion reported higher rumination following the task, even when controlling for baseline rumination.

Due to the relationship the two processes are proposed to have, the use of cognitive defusion techniques would be expected to lower levels of rumination in the longer term. Outcome studies of specific cognitive defusion techniques could also be used in order to compare pre and post measures of rumination and cognitive fusion. In this way, outcome studies may determine if cognitive defusion strategies can successfully moderate rumination, and whether such moderation is beneficial in treating depression i.e. whether changes in cognitive fusion mediate changes in symptoms. The CFQ28 could also be used as an outcome measure in rumination focussed treatment studies.

There is also scope for myriad studies exploring potential interacting variables between cognitive fusion and depression. As already stated, the current study cannot determine whether the relationship found between cognitive fusion and depression is direct or mediated by other factors. One potential mutual variable linking cognitive fusion and depression, proposed by ACT theory, is avoidance behaviours. It is suggested that the avoidance of private experiences is detrimental because it prevents individuals from responding to aversive stimuli and often has the paradoxical effect of increasing avoided material (Hayes *et al.*, 1999; Wenzlaff & Wenger, 2000). High ruminators may avoid the private experience of negative affect through rumination and in so doing may actually worsen their negative mood. Moulds and colleagues (2007) suggest that rumination promotes focus on this disorder-specific material and, consistent with theories about worry, rumination functions to limit the emotional

impact of negative material and/or to limit contact with the environment. In other words, rumination functions as experiential and/or behavioural avoidance: it is an avoidant coping strategy. Support for this link between rumination and avoidance has arisen from various studies. For example, it has been found that rumination relates to delayed response to symptoms of breast cancer, which supports the hypothesis that high ruminating individuals avoid dealing with emotionally threatening material (Lyubomirsky *et al.*, 2006). In another study, it has been found that individuals that engage in (rumination-like) post-event processing tend to avoid social situations that are similar to the one that initiated rumination (Rachman *et al.*, 2000). Rumination has also been linked to increased alcohol abuse, which can be viewed as an emotional avoidance strategy (Nolen-Hoeksema & Harrell, 2002). In order to explore this further, measures of avoidance such as the Cognitive-Behavioural Avoidance Scale (CBAS; Ottenbreit & Dobson, 2004) could be included in future studies.

Finally, although studied within the context of major depressive disorder, processes such as rumination are trans-diagnostic and can be found in other clinical populations. For example higher levels of rumination and beliefs about the benefits of rumination have been found in patients with Anorexia Nervosa as compared with non-clinical controls (Rawal *et al.*, 2010). This indicates that future research into cognitive fusion and rumination within other clinical populations may also be useful in exploring the role of cognitive fusion more generally within psychopathology.

4.6.2 Metacognition research

As with cognitive fusion, future studies with prospective longitudinal designs are needed to establish the temporal relationships between metacognitive beliefs about rumination, rumination and depression. That is, to clarify whether individuals with pre-existing high levels of such metacognitions are more likely to engage in rumination when depressed, or whether individuals with pre-existing high levels of rumination are more likely to then endorse beliefs which support the use of rumination, when depressed. It is proposed by the metacognitive model that positive beliefs about rumination are a vulnerability factor for rumination. To support this hypothesis it would be necessary to show that such beliefs are antecedent to, and predictive of, future rumination or depression. In addition, experimental studies manipulating metacognitions and then examining the degree of rumination produced in response to a subsequent negative event may help to disentangle the causal relationship between metacognitions and rumination.

In order to assess the specific impact of metacognitions on rumination and depression, analytical examinations of processes which target these beliefs require further assessment. Until now, research has focused on overall treatment outcomes for entire treatment packages which target multiple components, including attention. Conclusions about the role of metacognition in maintaining rumination can therefore not be drawn until more specific experimental studies of metacognition are carried out.

4.6.3 Combined research

As previously discussed, it may be the case that rumination, metacognitions and cognitive fusion are linked by other common factors, rather than having direct relationships. For example, from an ACT perspective, the relationship found in this study between cognitive fusion and positive beliefs about rumination may be indirect, with reason-giving being the mutual variable. Further cross-sectional studies which include such variables would allow for the exploration of such hypotheses. This was not carried out in the current study due to a need to limit the response burden for participants. However, future studies may simply use self-report measures of depression symptomatology, rather than the more detailed but lengthier diagnostic interview used in this study: Structured Clinical Interview for DSM-IV (SCID; First *et al.*, 1997). This would allow time for other measures to be included, such as the reasons for depression questionnaire (RFD; Addis *et al.*, 1995).

4.7 Summary

In conclusion, the results of this research project suggest that the further development of research into cognitive fusion and cognitive defusion techniques is likely to provide a valuable contribution in clarifying processes which aid reduction of depression. In addition, it may be the case that by gaining greater understanding of the relationship between cognitive fusion and rumination, additional techniques can be targeted at reducing the impact of cognitive processes which are known to

promote the recurrence of depression. It is hoped that this study provides a useful basis from which future studies can be developed.

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Appendix A: Letter of ethical approval (SREC)

Lothian NHS Board

Deaconess House
148 Pleasance
Edinburgh
EH8 9RS
Telephone 0131 536 9000
Fax 0131 536 9009
www.nhslothian.scot.nhs.uk



South East Scotland Research Ethics Committee 03

Deaconess House
148 Pleasance
Edinburgh
EH8 9RS

Telephone: 0131 536 9022
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19 February 2010

Ms Eleonore S Kerr
Trainee Clinical Psychologist
NHS Grampian
Clinical Psychology, Block A,
Clerkseat Building, Royal Cornhill,
Aberdeen
AB25 2ZH

Dear Ms Kerr

Study Title: The role of rumination in depression: thought content
and thought context
REC reference number: 09/S1103/51
Protocol number: V.1

Thank you for your letter dated 29 January 2010, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by the chair on behalf of SESREC 3

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.



Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

For NHS research sites only, management permission for research (“R&D approval”) should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>. *Where the only involvement of the NHS organisation is as a Participant Identification Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.*

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Covering Letter		
REC application		
Protocol		
Investigator CV		
Participant Consent Form		
GP/Consultant Information Sheets		
Evidence of insurance or indemnity		
Letter from Sponsor		15 December 2009
Interview Schedules/Topic Guides		
Questionnaire		
Questionnaire		
Questionnaire	V.1	14 December 2009
INSTRUCTIONS	V.1	15 December 2009
Questionnaire	V.1	14 December 2009
Participant Information Sheet: PIS Group 1	2	29 January 2010
Participant Information Sheet: PIS Group 2	2	29 January 2010
Participant Consent Form: PCF Group 2	2	29 January 2010
Participant Consent Form: PCF Audio - recording	2	29 January 2010
Response to Request for Further Information		29 January 2010

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

09/S1103/51

Please quote this number on all correspondence

Yours sincerely



Dr Christine West
Chair

Email: joyce.clearie@nhslothian.scot.nhs.uk

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments [if final opinion was confirmed was given at a meeting]

"After ethical review – guidance for researchers" [SL-AR1 for CTIMPs, SL- AR2 for other studies]

*Copy to: Mrs Elspeth Currie
[R&D office for NHS care organisation at lead site]*

Appendix B: Letter of approval (R&D)

Research and Development

Foresterhill House Annexe
Foresterhill
Aberdeen
AB25 2ZB



Ms Eleonore S Kerr
Trainee Clinical Psychologist
Clinical Psychology
Block A
Clerkseat Building
Royal Cornhill Hospital
Aberdeen
AB25 2ZH

Date 22/03/10
Our Ref 2010PC004
Enquiries to
Extension 51121
Direct Line 01224 551121

Dear Ms Kerr

Management Approval for Non-Commercial Research

Ethics Ref: 09/S1103/51
Project title: The role of rumination in depression: thought content and thought context

Thank you very much for sending all relevant documentation. I am pleased to confirm that the above project is now registered with the NHS Grampian Research & Development Office. The project now has R & D Management Approval to proceed locally. This is based on the documents received from yourself and the relevant Approvals being in place.

All research with an NHS element is subject to the Research Governance Framework for Health and Community Care (2006, 2nd edition), and as Chief or Principal Investigator you should be fully committed to your responsibilities associated with this.

It is particularly important that you inform us when the study terminates.

The R&D Office must be notified immediately and any relevant documents forwarded to us if any of the following occur:

- A change of Principal Investigator, Chief Investigator or any additional research personnel
- Premature project termination
- Any amendments – substantial or non-substantial (particularly a study extension)
- Any change to funding or any additional funding
- Any Serious Adverse Events

We hope the project goes well, and if you need any help or advice relating to your R&D Management Approval, please do not hesitate to contact the office.

Yours sincerely

A handwritten signature in black ink, appearing to read 'S. Ridge', with a stylized flourish at the end.

Susan Ridge
Business Development Officer

Appendix C: Participant letter of invitation

**GP PRACTICE/
PRIMARY CARE
MENTAL HEALTH
TEAM**

Address of GP practice
or Primary Care Mental
Health Team
Grampian
ABXX XXX
Tel: XXXXXXXXXX
Fax: XXXXXXXXXX

Address of patient

Date

Enquiries to

Direct Line

Dear

You are being invited to take part in a research study.

Anybody who is known to this GP practice/Primary Care Mental Health Service with a diagnosis of depression is being invited to take part in this study.

The research is being carried out by Ms Sian Kerr (Trainee Clinical Psychologist) who is employed by NHS Grampian and is carrying out postgraduate study at the University of Edinburgh.

An information sheet is enclosed which gives further information about what would be involved. Participation in the research is completely voluntary and your choice to take part or not take part will in no way affect your future medical treatment or waiting time for services.

If you are interested in taking part, please complete the slip below, and the consent form enclosed, and return them in the stamped addressed envelope, within the next four weeks.

Yours sincerely

Signature
GP / Primary Care Mental Health Worker

Study title: Rumination in depression

I am interested in taking part in this study.

I can be contacted on (tel)..... by the researcher, to arrange a suitable time and date to carry out a brief interview and complete some short questionnaires.

Version 1 Date: 14/12/09

Appendix D: Participant information sheet – group 1 & 2



Participant Information Sheet

Group 1/ 2 Version 2 Date: 29/01/10

Study title: Rumination in depression

You are being invited to take part in a research study and it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish before you decide to take part. *Thank you for your time.*

Why are we doing this research?

This research project is investigating styles of thinking in people with depression. Most people experience negative thoughts at times. When depressive thinking is prolonged and repetitive, it is called *rumination*. This study aims to identify whether people with depression have a particular style of thinking, such as rumination, and to explore some possible reasons for why they might do this.

Why have I been invited to take part?

Anybody who is known to this GP practice with a diagnosis of depression will be invited to take part in this study.

Do I have to take part?

No, it is up to you whether you take part. If you do, you will be asked to sign a consent form saying that you have agreed to take part in this research study. You will be given a copy of your signed consent form to keep. You are free to change your mind at any time during the study without giving a reason. If you change your mind and withdraw from the study, any treatment you are having now or in the future will not be affected.

What is involved?

The research involves you completing a short interview (which will take about 10 minutes) and some questionnaires about your thoughts, feelings and symptoms of depression. This will take thirty minutes in total to complete. You will be asked if you agree to the short interview being audio-recorded, and asked to sign a consent form for this. The consent form will detail what will happen to this recording. You are free to change your mind and withdraw at any time during the study without giving a reason. If you change your mind and withdraw from the study, any questionnaires you have completed or interview recordings will be destroyed.

Is there any harm in participating in this research?

The interview and questionnaires used in this study will be very unlikely to cause you harm. However, if you found answering the questionnaires or taking part in the interview troubling, you could discuss these with you the researcher Sian Kerr at the time of the interview.

How is this research useful?

We cannot promise the study will help you personally but the information we get from this study will help us to understand more about thought processes in depression. In the long term, this understanding may contribute towards developing improved ways of treating people with depression.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the named researcher (Sian Kerr) on the consent form, who will do their best to answer your questions. If you would prefer to speak to somebody about this study who is independent, you can contact Dr Sam Aitcheson (Clinical Psychologist) who knows about this study (contact details below). If you remain unhappy and wish to complain formally, you can do this through the NHS Grampian Complaints Procedure. Details can be obtained from your GP practice.

What will happen to the results of this study?

The results of this study will be written up for a Doctoral thesis at the University of Edinburgh and a copy of the thesis will be stored in the University Library. In addition, the results will be published in scientific journals and presented at conferences. All results of this study will be reported anonymously, you will not be able to be identified from any information used in the study or publications following the study. A summary of the results can be sent to your home address at the end of the study. If you wish to receive a summary of the results, please indicate this on the consent form and add your address in the section provided. Please note that this is optional and you do not have to give your address.

Will the information be kept confidential?

All information which is collected about you and from you during the course of this research will be kept strictly confidential. Only the named researcher (Sian Kerr) and two NHS Clinical Psychologist supervisors will have access to this information. Any information about you that leaves the NHS site will have your name and address removed so that you cannot be recognised from it. If you do opt to receive a summary of the results, your name and address will be kept separate from all research information.

Who is organising and funding the research?

This study is part of the researcher's Doctorate in Clinical Psychology (D.Clin.Psychol) qualification. This qualification is being completed through the National Health Service (NHS Grampian), NHS Education for Scotland (NES) and the University of Edinburgh.

Who has reviewed the study?

All research is looked at by an independent group of people, called a Research Ethics Committee, to protect your safety, rights, wellbeing and dignity. In addition to undergoing review by the National Health Service's ethics committee, this study has been approved by Edinburgh University School of Health in Social Science Research Ethics Committee.

Can I get further Information?

If you would like any further information about this study, please contact Sian Kerr (Trainee Clinical Psychologist) on xxxxxxx. If you would prefer to speak to somebody about this study who is independent, you can contact Dr Sam Aitcheson (Clinical Psychologist) on xxxxxxx.

Thank you for considering taking part in this study.

Appendix E: Participant information sheet – group 3



Participant Information Sheet

Group 3

Version 2

Date: 29/01/10

Study title: Rumination in depression

You are being invited to take part in a research study and it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish before you decide to take part. If you are interested in taking part, please contact the named researcher, Sian Kerr (contact details overleaf). *Thank you for your time.*

Why are we doing this research?

This research project is investigating styles of thinking in people with depression. Most people experience negative thoughts at times. When depressive thinking is prolonged and repetitive, it is called *rumination*. This study aims to identify whether people with depression have a particular style of thinking, such as rumination, and to explore some possible reasons for why they might do this.

Why have I been invited to take part?

In order to compare thinking styles between people with and without depression, adults between the ages of 18 and 65, *without* an existing or previous diagnosis of clinical depression are being invited to participate.

Do I have to take part?

No, it is up to you whether you take part. If you do, you will be asked to sign a consent form saying that you have agreed to take part in this research study. You will be given a copy of your signed consent form to keep. You are free to change your mind at any time during the study without giving a reason.

What is involved?

The research involves you completing a short interview (which will take 10 minutes) and some questionnaires about your thoughts, feelings and any symptoms of depression. This will take thirty minutes to complete. You will be asked if you agree to the short interview being audio-recorded, and asked to sign a consent form for this. The consent form will detail what will happen to this recording. You are free to change your mind and withdraw at any time during the study without giving a reason. If you change your mind and withdraw from the study, any questionnaires you have completed or interview recordings will be destroyed.

Is there any harm in participating in this research?

The interview and questionnaires used in this study will be very unlikely to cause you harm. However, if you found answering the questionnaires or taking part in the interview troubling, you could discuss these with the researcher Sian Kerr at the time of the interview.

How is this research useful?

We cannot promise the study will help you personally but the information we get from this study will help us to understand more about thought processes in depression. In the long term, this understanding may contribute towards developing improved ways of treating people with depression.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the named researcher (Sian Kerr) on the consent form, who will do their best to answer your questions. If you would prefer to speak to somebody about this study who is independent, you can contact Dr Sam Aitcheson (Clinical Psychologist) who knows about this study (contact details below). If you remain unhappy and wish to complain formally, you can do this through the NHS Grampian Complaints Procedure. Details can be obtained from your GP practice.

What will happen to the results of this study?

The results of this study will be written up for a Doctoral thesis at the University of Edinburgh and a copy of the thesis will be stored in the University Library. In addition, the results will be published in scientific journals and presented at conferences. All results of this study will be reported anonymously, you will not be able to be identified from any information used in the study or publications following the study. A summary of the results can be sent to your home address at the end of the study. If you wish to receive a summary of the results, please indicate this on the consent form and add your address in the section provided. Please note that this is optional and you do not have to give your address.

In the unlikely event that the assessment highlights underlying mood problems such as depression, then you will be informed of this through verbal feedback of the assessment and advised to contact your general practitioner (GP). You must give consent for this verbal feedback and advice to be given to you on the consent form provided, in order to be included in the study.

Will the information be kept confidential?

All information which is collected about you and from you during the course of this research will be kept strictly confidential. Only the named researcher (Sian Kerr) and two NHS Clinical Psychologist supervisors will have access to this information. Any information about you that leaves the NHS site will have your name and address removed so that you cannot be recognised from it. If you do opt to receive a summary of the results, your name and address will be kept separate from all research information.

Who is organising and funding the research?

This study is part of the researcher's Doctorate in Clinical Psychology (D.Clin.Psychol) qualification. This qualification is being completed through the National Health Service (NHS Grampian), NHS Education for Scotland (NES) and the University of Edinburgh.

Who has reviewed the study?

All research is looked at by an independent group of people, called a Research Ethics Committee, to protect your safety, rights, wellbeing and dignity. In addition to undergoing review by the National Health Service's ethics committee, this study has been approved by Edinburgh University School of Health in Social Science Research Ethics Committee.

Can I get further information?

If you would like any further information about this study, please contact Sian Kerr (Trainee Clinical Psychologist) on xxxxxxxx. If you would prefer to speak to somebody about this study who is independent, you can contact Dr Sam Aitcheson (Clinical Psychologist) on xxxxxxxx.

IF YOU ARE INTERESTED IN PARTICIPATING, PLEASE CONTACT SIAN KERR (TRAINEE CLINICAL PSYCHOLOGIST) ON xxxxxxxx or EMAIL: [REDACTED]

Thank you for considering taking part in this study.

Appendix F: Consent form – group 3

Appendix G: Consent form – group 1 & 2

Appendix H: Consent form for audio-recordings

Name of researcher: Sian Kerr



CONSENT FORM FOR AUDIO-RECORDING OF INTERVIEW

Title of Project: **Rumination in depression**

- 1. I understand that the audio-recording of my interview will remain confidential and will be listened to by the named researcher and by one NHS Clinical Psychologist supervisor.
- 2. I understand that the audio-recording of my interview will be kept in a locked cabinet and will be destroyed by end December 2010.
- 3. I understand that I can withdraw my consent to be audio-recorded at any time during my interview.
- 4. I agree to take part in the above study.

I hereby **consent/do not consent** to be audio-recorded during this interview.

Name of participant Signature Date

Name of researcher Signature Date

Appendix I: Centre for Epidemiologic Studies Depression Scale (CESD)



**STANFORD
PATIENT EDUCATION
RESEARCH CENTER**

Center for Epidemiologic Studies Depression Scale (CES-D)

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the **past week**: (*circle one number on each line*)

During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)
1. I was bothered by things that usually don't bother me.....	0	1	2	3
2. I did not feel like eating; my appetite was poor.....	0	1	2	3
3. I felt that I could not shake off the blues even with help from my family.....	0	1	2	3
4. I felt that I was just as good as other people.....	0	1	2	3
5. I had trouble keeping my mind on what I was doing.....	0	1	2	3
6. I felt depressed.....	0	1	2	3
7. I felt that everything I did was an effort.....	0	1	2	3
8. I felt hopeful about the future.....	0	1	2	3
9. I thought my life had been a failure.....	0	1	2	3
10. I felt fearful.....	0	1	2	3
11. My sleep was restless.....	0	1	2	3
12. I was happy.....	0	1	2	3
13. I talked less than usual.....	0	1	2	3
14. I felt lonely.....	0	1	2	3
15. People were unfriendly.....	0	1	2	3

During the past week...	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	All of the time (5-7 days)
16. I enjoyed life.....	0	1	2	3
17. I had crying spells	0	1	2	3
18. I felt sad	0	1	2	3
19. I felt that people disliked me	0	1	2	3
20. I could not "get going"	0	1	2	3

Scoring

Item Weights	Rarely or none of the time (less than 1 day)	Some of a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	All of the time (5-7 days)
Items 4, 8, 12, & 16	3	2	1	0
All other items:	0	1	2	3

Score is the sum of the 20 item weights. If more than 4 items are missing, do not score the scale. A score of 16 or greater is considered depressed.

Characteristics

Tested on 175 subjects.

No. of items	Observed Range	Mean	Standard Deviation	Internal Consistency Reliability	Test-Retest Reliability
20	1-53	16.2	10.9	.91	NA

Source of Psychometric Data

Stanford Arthritis Self-Management Study, 1996. Unpublished.

Comments

We are no longer using the CES-D in multiethnic studies because we have found that the norms for various ethnic groups differ. This scale is available in Spanish.

References

Radloff LS, The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 1977, pp.385-401.

This scale is free to use without permission

Stanford Patient Education Research Center

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Funded by the National Institute of Nursing Research (NINR)

Appendix J: Short Response Styles Questionnaire (SRSQ)

SHORT RESPONSE STYLES QUESTIONNAIRE

Code: _____

Date: _____

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

(Please Circle)

- | | Never | Sometimes | Often | Always |
|--|-------|-----------|-------|--------|
| 1. I think about how alone I feel | 1 | 2 | 3 | 4 |
| 2. I think about my feelings of fatigue and achiness | 1 | 2 | 3 | 4 |
| 3. I think about how hard it is to concentrate | 1 | 2 | 3 | 4 |
| 4. I think about how passive and unmotivated I feel | 1 | 2 | 3 | 4 |
| 5. I think "why can't I get going?" | 1 | 2 | 3 | 4 |
| 6. I think about a recent situation, wishing it had gone better | 1 | 2 | 3 | 4 |
| 7. I think about how sad I feel | 1 | 2 | 3 | 4 |
| 8. I think about all my shortcomings, failings, faults and mistakes. | 1 | 2 | 3 | 4 |
| 9. I think about how I don't feel up to doing anything | 1 | 2 | 3 | 4 |
| 10. I think "Why can't I handle things better?" | 1 | 2 | 3 | 4 |

Appendix K: Positive Beliefs About Rumination Scale -
Adapted (PBRs-A)

PBRs-A

Instructions

Listed below are a number of beliefs. Please read each belief carefully and indicate how much you *generally* agree with each one. Please circle the number that best describes your answer. Please respond to all the items.

1	2	3	4
Do not agree	Agree slightly	Agree moderately	Agree very much

- | | | | | |
|--|---|---|---|---|
| 1. I need to think about things to find answers to my how I feel | 1 | 2 | 3 | 4 |
| 2. Thinking about things helps me to understand past mistakes and failures | 1 | 2 | 3 | 4 |
| 3. I need to think about the causes of the feelings I experience | 1 | 2 | 3 | 4 |
| 4. Thinking about my emotions helps me to recognize the triggers for how I feel | 1 | 2 | 3 | 4 |
| 5. I need to think about the things that have happened in the past to make sense of them | 1 | 2 | 3 | 4 |
| 6. In order to understand my feelings, I need to think about my problems | 1 | 2 | 3 | 4 |
| 7. Thinking about the past helps me to prevent future mistakes and failures | 1 | 2 | 3 | 4 |
| 8. Thinking about the past helps me to work out how things could have been done better | 1 | 2 | 3 | 4 |
| 9. Thinking about my problems helps me to focus on the most important things | 1 | 2 | 3 | 4 |

Appendix L: Cognitive Fusion Questionnaire (CFQ28)

CFQ-28

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. My thoughts cause me distress or emotional pain | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I tell myself that I shouldn't be thinking the way I'm thinking | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Even when I am having distressing thoughts, I know that they may become less important eventually | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I find myself preoccupied with the future or the past | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I make judgements about whether my thoughts are good or bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Even when I'm having upsetting thoughts, I can see that those thoughts may not be literally true | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I get upset with myself for having certain thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I feel like my thoughts need to change before I can have a good life | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I find it easy to view my thoughts from a different perspective | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I tend to get very entangled in my thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. I think some of my thoughts are bad or inappropriate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. I feel upset when I have negative thoughts about myself | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. I get very focussed on distressing thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. My thoughts distract me from what I'm actually doing | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. I get so caught up in my thoughts that I am unable to do the things that I most want to do | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I over-analyse situations to the point where it's unhelpful to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. I can watch my thoughts from a distance without getting caught up in them | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. It is OK to have inconsistent thoughts on the same subject | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Its possible for me to have negative thoughts about myself and still know that I am an OK person | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Please turn over

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true
21. I am able to do what's important in my life even when I have upsetting thoughts					1	2 3 4 5 6 7
22. I struggle with my thoughts					1	2 3 4 5 6 7
23. I can do difficult things even if my thoughts say they are impossible to do					1	2 3 4 5 6 7
24. I can be aware of my thoughts without necessarily reacting to them					1	2 3 4 5 6 7
25. Once I've thought about something upsetting its difficult for me to focus on anything else					1	2 3 4 5 6 7
26. I need to control the thoughts that come into my head					1	2 3 4 5 6 7
27. I tend to react very strongly to my thoughts					1	2 3 4 5 6 7
28. I get so caught up in my thoughts that I forget what I'm actually doing					1	2 3 4 5 6 7

Thank you for completing this questionnaire

Appendix M: Cognitive Fusion Questionnaire – short version
(CFQ13)

CFQ13

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| 1. My thoughts cause me distress or emotional pain | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I get so caught up in my thoughts that I am unable to do the things that I most want to do | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Even when I am having distressing thoughts, I know that they may become less important eventually | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I over-analyse situations to the point where it's unhelpful to me | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I struggle with my thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Even when I'm having upsetting thoughts, I can see that those thoughts may not be literally true | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I get upset with myself for having certain thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I need to control the thoughts that come into my head | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I find it easy to view my thoughts from a different perspective | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I tend to get very entangled in my thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. I tend to react very strongly to my thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Its possible for me to have negative thoughts about myself and still know that I am an OK person | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. It's such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Thank you for completing this questionnaire