

The interpersonal context of rumination: An investigation of interpersonal antecedents
and consequences of the ruminative response style

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Abstract

The thesis aim was to increase understanding of interpersonal antecedents and consequences of rumination, defined as ‘repetitive and passive thinking about one’s symptoms of depression and the possible causes and consequences of those symptoms’ (Nolen-Hoeksema, 2004, p.107). As a proof-of-principle study, rumination predicted diminished relationship satisfaction, three months later, in a sample of remitted depressed adults ($N = 57$). In the next study, rumination was associated with a maladaptive submissive interpersonal style and rejection sensitivity, controlling for depressive symptoms, other interpersonal styles and gender, in a different sample ($N = 103$ currently depressed, previously depressed and never depressed adults). Subsequent chapters incorporated a second assessment point of data from this same sample. Longitudinal analyses were undertaken to investigate; a) do rumination and depressogenic interpersonal factors predict future depression?; b) does rumination prospectively predict increased rejection sensitivity and submissive interpersonal behaviours, and, vice-versa, do these interpersonal factors predict increased rumination?; c) does rumination prospectively predict poor social adjustment and interpersonal stress? Consistent with previous findings, Time 1 rumination predicted increased depression six months later. Unexpectedly, the effect of rumination on future depression was mediated by its relationship with the submissive interpersonal style. Partially consistent with the stated predictions, Time 1 rejection sensitivity (but not the submissive interpersonal style) prospectively predicted increased rumination, but rumination did not predict rejection sensitivity or the submissive interpersonal style. As predicted, rumination prospectively predicted increased chronic interpersonal stress and poor social adjustment (but not acute interpersonal stress). In a final study, rumination was manipulated via an applied

intervention (concreteness training, CT), within the context of a randomized controlled trial ($N = 79$ clinically depressed adults). Analyses compared the change in social adjustment and submissive interpersonal behaviour reported in the CT condition compared to a treatment as usual (TAU) condition. There was a significantly greater reduction in rumination in the CT compared to TAU condition, $p < .05$. Moreover, the reduction in submissive interpersonal behaviours was significantly greater in the CT compared to TAU condition, $p < .05$. The change in social adjustment was not greater in the CT compared to TAU condition. Thus, a psychological intervention which reduces rumination decreased maladaptive submissive interpersonal behaviour. The implications of the findings are discussed in relation to theory of rumination and interpersonal theories of depression.

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Notes on thesis structure

The thesis has a paper based structure. Chapters 2 to 6 are presented in the form of manuscripts submitted for publication. These are at various stages in the review progress and the status of each paper is summarised below in Table *i*. The main text in each chapter is presented as an exact replication of the submitted manuscript as required by the School of Psychology's guidelines for a paper-based thesis. A preface is provided at the beginning of each chapter which clarifies the contribution of each manuscript to the aims and hypotheses of the thesis. Some adjustments have been made to the presentation of the papers to help the reader: a) a global numbering system has been applied to the entire thesis; b) figures and tables have been presented in the appropriate positions rather than at the end of each manuscript and table numbering has been altered to reflect their combination into the thesis (e.g. table 1 in chapter 2 becomes table 2.1); c) Given a number of co-authors have contributed to each paper, Appendix 1 presents a series of declarations that confirm the level of input for each author in preparation of the manuscripts.

Table *i*

Publication status of papers presented in the thesis

Chapter	Journal	Status
3	British Journal of Clinical Psychology	Published
4	Behaviour Research and Therapy	Published
5	Behaviour Research and Therapy	Published
6	Behaviour Research and Therapy	In revision
7	Behaviour Research and Therapy	Submitted

CHAPTER 1: Introduction

Rumination is increasingly recognized as being an important vulnerability factor for depression (Nolen-Hoeksema, 2004; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, Watkins, 2008). Similarly, a range of different interpersonal factors have been identified as conferring vulnerability to depression (Coyne, 1976a, 1976b; Gilbert & Allen, 1994; Joiner, 2000), and there is a substantive body of empirical evidence which suggests that depression impairs interpersonal functioning and erodes social support (for reviews see Hirschfeld, et al., 2000; Tse & Bond, 2004).

Whilst depression vulnerable individuals are at an increased risk of experiencing relationship difficulties (Beach & O'Leary, 1993; Davila, Bradbury, Cohan, & Tochluk, 1997) and interpersonal rejection (Coyne, 1976a, 1976b), social support can offer potential protective benefits against depression recurrence (Harris, Brown, & Robison, 1999; McLaren & Challis, 2009). Moreover, recent findings suggest that depressed ruminators gain particular benefits from the support of close others (Nolen-Hoeksema & Davis, 1999).

These converging findings highlight the importance of delineating the relationship between rumination and depressogenic interpersonal mechanisms. Fundamentally, increasing understanding of the relationship between inter- and intra-personal mechanisms which maintain depression is necessary to inform the development of effective integrated cognitive and interpersonal psychological interventions.

Thesis outline and objectives

The overarching aim of the current thesis is to increase understanding of the temporal and causal relationship between rumination, poor social adjustment, and key depressogenic interpersonal factors (insecure attachment orientation and maladaptive interpersonal styles). The thesis is structured as follows: Chapter 2 provides an overview of depression symptomatology and prevalence, followed by a review of the theory, evidence, psychological treatments and methods of assessment which underpin current understanding of: a) rumination; b) interpersonal mechanisms implicated in depression; c) emerging theory and evidence which indicates that rumination and depressogenic interpersonal mechanisms are related.

Analyses are reported from three different samples: a group of remitted depressed adults ($N = 57$, chapter 3); a heterogeneous adult sample of currently depressed, previously depressed and never depressed individuals ($N = 103$, chapters 4 - 7); and adults meeting DSM-IV criteria for current major depression ($N = 79$, chapter 8). Chapter 3 (study 1) extends previous cross-sectional findings which indicated that rumination is correlated concurrently with diminished relationship satisfaction (Kuehner & Bueger, 2005) to a prospective design. Chapter 4 (study 2) examines the concurrent relationship between rumination and a comprehensive range of interpersonal variables, controlling for shared variance with depression, with the aim of assessing whether rumination is associated with a specific sub-set of interpersonal variables. Chapter 5 (study 3) incorporates a second follow-up data time point collected from the same sample, enabling an evaluation of the prospective relationship between rumination and interpersonal variables predicting depression. Chapter 6 (study 4) assesses the temporal relationship

between rumination and the maladaptive interpersonal styles. Chapter 7 (study 5) assesses the relationship between rumination and interpersonal variables implicated in stress generation and interpersonal stress. Chapter 8 (study 6) assesses whether the manipulation of rumination via a clinical intervention (concrete training) improves interpersonal functioning compared to treatment as usual and another active intervention. The thesis ends with a general discussion.

CHAPTER 2: Literature review

The following review has four main sections: Section 2.1 summarizes depression symptomatology and prevalence, and provides a brief outline of the cognitive and interpersonal models of depression which underpin the thesis; Section 2.2 provides an overview of the theory and empirical evidence which substantiates current understanding of rumination; Section 2.3 describes the interpersonal context of depression, summarizing theoretical models and empirical evidence which delineate adverse interpersonal consequences of depression and interpersonal vulnerability factors; Section 2.4 reviews the current theory and empirical evidence which suggests that rumination and interpersonal depressogenic factors are interrelated.

2.1 Depression symptomatology and prevalence

Depression is a common, heterogeneous condition with multiple causes, a complex symptomatology and broad spectrum of severity. The symptoms of depression most commonly include sustained depressed or sad mood and an ongoing loss of interest or pleasure in normally enjoyable activities. The American Psychiatric Association's Diagnostic and Statistic Manual of Mental Disorders (DSM-IV-TR, American-Psychiatric-Association, 1994) provides a prototype for the diagnosis of clinical depression. According to the DSM-IV-TR criteria, the key criteria for major depression are a persistent depressed mood and/or loss of interest and pleasure in activities (anhedonia). Other symptoms include loss of appetite or weight loss, disturbed sleep, psychomotor agitation or retardation, fatigue, feelings of worthlessness, intense feelings of guilt, concentration difficulties, and recurring thoughts of death or suicide ideation. To

meet diagnostic criteria, symptoms should be present for at least two weeks, and each symptom should be present for most of every day. In addition, clinically significant distress or impairment in social, occupational, or other important areas of functioning should also be present.

2.1.1 Prevalence of depression

Depression is a highly prevalent disorder, and was ranked as the third highest cause of worldwide disease burden in 2004 (WHO, 2004). Depression has huge potential personal costs. Most seriously, depression is associated with an increased risk of suicide, with an estimated 50 fold increase over the population base rate (Stolberg, Clark, & Bongar, 2002). Depression also has enormous social and economic costs for society as a whole: It has been estimated that, taking account of increased absenteeism, the total loss of output due to depression and chronic anxiety is approximately £12 billion a year, representing 1% of the UK total national income (Layard, Bell, & Clarke, 2006)

Depression is a highly recurrent disorder, with approximately 50% of those who have recovered from an episode of major depression experiencing another episode (Belsher & Costello, 1988). Furthermore, the risk of depression recurrence increases with each additional prior episode, so that those experiencing two episodes have a 90% chance of suffering a third episode, and with relapse rates of 40% within 15 weeks for individuals with three or more lifetime episodes (Kupfer, Frank, & Warmhoff, 1996). Depression is more common in females than males, and, by adolescence, girls are twice as likely as boys to be diagnosed with depression (Nolen-Hoeksema, 2002).

2.1.2 Theoretical models of depression

At the forefront of contemporary psychological accounts of depression are the

cognitive and interpersonal approaches.

2.1.2.1 Cognitive theory of depression

Beck's (1983; 1987) seminal cognitive theory of depression is founded on the idea that maladaptive self-schemata, which represent 'cognitive structures that organize and process incoming information' (Dobson & Dozois, 2001, p.15), containing dysfunctional attitudes, are core cognitive vulnerabilities for depression. Dysfunctional attitudes commonly involve themes of loss, inadequacy, failure, and worthlessness. Beck argued that when negative self-schemata are activated in response to negative life events, they trigger negative cognitions which relate to an overly pessimistic view of self, the world, and the future (the negative cognitive triad), generating depression. Critically, Beck emphasized that the thinking of depressed individuals is negatively biased/distorted. Beck also hypothesised that difference between individuals' underlying orientation toward self (value placed on independence, freedom and achievement, labelled autonomy) and other (value placed on social relationships and intimacy, labelled sociotropy) effect how they respond to different types of events and whether depression is likely to occur. This specific-vulnerability hypothesis predicts that sociotropic individuals are more likely to become depressed in response to interpersonal events, whereas autonomous individuals are more likely to become depressed responding to achievement related events.

2.1.2.2 Interpersonal theories of depression

In contrast to the cognitive focus on intrapersonal mechanisms, interpersonal approaches to depression (Brown & Harris, 1978; Coyne, 1976a, 1976b; Hammen, 1991, 2006; Joiner, 2000) have focused on understanding depression within a broader

environmental context. Joiner, Coyne, and Blalock (1999) asserted that depression cannot be fully understood without taking account of the social and interpersonal context. Instead, Joiner, et al. (p.7) argued that depression can be explained and understood in relation to 'readily observable interpersonal processes'. Lewinsohn's (1974) behavioural model emphasized the role of social skills deficits as a cause of depression. However, Coyne (1976a, 1976b) proposed an alternative interactional model which assumed that individuals actively shape their social environment. Coyne argued that those vulnerable to depression are likely to engage in excessively seeking reassurance from other people to bolster a diminished sense of self-worth, and to provide assurance that they are loved. Coyne further hypothesised that depressed individuals are likely to doubt the sincerity of reassurance provided by close others, triggering a negative spiral in which excessive reassurance-seeking behaviour generates increasingly negative and rejecting responses from frustrated partners.

2.1.2.3 Integrative cognitive-interpersonal models

Increasing emphasis has been given in the literature to integrative theoretical models which incorporate both cognitive and interpersonal mechanisms. These have focused on explaining how underlying cognitive structures/schemas shape interpersonal behaviour. Thus, in an elaboration of Coyne's (1976) interactional model, Schmidt, Schmidt, and Young (1999) hypothesised that underlying cognitive-diatheses (e.g., dependency schemas) influence excessive reassurance-seeking behaviours. Similarly, Zuroff, Mongrain, and Santor (2004, p. 496) argued that the disturbed social milieu characteristic of depression vulnerable individuals can be explained because underlying intrapersonal structures 'influence whom one selects to be part of one's social network,

how one perceives and remembers social interactions, and which social behavioural strategies one uses'. In a consideration of the clinical implications of these integrated cognitive and interpersonal models, Safran (1990a, p.88) argued that cognitive formulations 'pay insufficient attention to the role of interpersonal and environmental variables'. Safran (1990b) proposed that cognitive therapists should use the therapeutic relationship as a vehicle for identifying maladaptive, interactional patterns (labelled 'interpersonal markers') occurring during therapy, and that these should provide a starting point for exploring and challenging maladaptive interpersonal schema (defined as 'a generic knowledge structure based on previous interpersonal experience, that contains information relevant to the maintenance of interpersonal relatedness', Safran, 1990a, p.87). Setting a new research agenda, these integrative models assume that (maladaptive) interpersonal behaviour is guided by underlying cognitive representations of self-other relationships, and that these underlying 'interpersonal schema' can confer vulnerability to depression.

This thesis will focus on the cognitive and interpersonal approaches to depression, integrating an intrapersonal psychological approach emphasizing the role of cognition in depression and an interpersonal psychological approach, which emphasizes the role of interpersonal style and social adjustment in depression. More specifically, consistent with an integrative cognitive-interpersonal model, the thesis will investigate how key processes within each approach, namely, rumination and interpersonal functioning, interact with each other in the onset and development of depression.

2.2 Depressive rumination: A key cognitive mechanism in depression

The following section reviews current understanding of rumination, provides an

overview of two key theoretical models of rumination that are pertinent to the current thesis (Response Styles Theory and Control Theory) and summarizes the empirical evidence by which these theories are underpinned.

2.2.1 Aetiology of rumination

Depressive rumination has been defined as ‘repetitive and passive thinking about one’s symptoms of depression and the possible causes and consequences of those symptoms’ (Nolen-Hoeksema, 2004, p.107). Rumination is associated with increased depressive symptoms (in adults, Ito, et al., 2003; Lam, Smith, Checkley, Rijdsdijk, & Sham, 2003, students, Richmond, Spring, Sommerfeld, & McChargue, 2001; Rude, Maestas, & Neff, 2007, adolescents, Grant, et al., 2004; Jose & Brown, 2008; Kuyken, Watkins, Holden, & Cook, 2006; Muris, Fokke, & Kwik, 2009; and children, Abela, Vanderbilt, & Rochon, 2004; Ziegert & Kistner, 2002). Rumination is also associated with suicidal ideation (Eshun, 2000, for a review see Morrison & O’Conner, 2008). Consistent with its conceptualisation as a stable individual difference characteristic, rumination has demonstrated relative stability over time in the context of fluctuating depressive symptoms (Bagby, Rector, Bacchioni, & McBride, 2004; Kuehner & Weber, 1999; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Nolen-Hoeksema, Parker, & Larson, 1994) and is elevated in remitted depressed compared to never depressed individuals (Roberts, Gilboa, & Gotlib, 1998).

Empirical findings indicate that women have elevated rumination compared to men, and that rumination mediates the gender difference in depression (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema, et al., 1993). Recent findings indicate that this gender

difference in rumination emerges with the onset of adolescence, and the transition from concrete to abstract thinking (at around twelve years, Jose & Brown, 2008). Personality characteristics associated with increased rumination include neuroticism (Kuyken, et al., 2006; Nolan, Roberts, & Gotlib, 1998; Roelofs, Huibers, Peeters, & Arntz, 2008; Roelofs, Huibers, Peeters, Arntz, & van Os, 2008), perfectionism (Harris, Pepper, & Maack, 2008; Olson & Kwon, 2008) and maladaptive interpersonal styles (Gorski & Young, 2002; Spasojević & Alloy, 2001, see section 2.4.2.3).

Nolen-Hoeksema (2004) proposed that rumination has developmental antecedents, related to parenting style and history of childhood abuse. Findings from a number of studies are consistent with this hypothesis. First, Nolen-Hoeksema, Mumme, Wolfson, and Guskin (1995) found that, in mothers, high levels of negative affect was associated with increased passive and helpless response styles in young children. Second, Spasojević and Alloy (2002) found that retrospective measures of over-controlling parenting, history of sexual abuse (women only), and emotional maltreatment were associated with a ruminative response style, and that rumination mediated the effect of these underlying developmental factors on subsequent major depressive episodes (assessed over a two year follow up period). Third, in a student sample, recall of parental abuse was associated with a ruminative response style, and rumination partially mediated the relationship between recalled abuse and depressive symptoms (Conway, Mendelson, Giannopoulos, Csank, & Holm, 2004). Fourth, in a more recent cross-sectional study, Raes and Hermans (2008) found that rumination mediated the effect of history of emotional abuse (retrospective account) on current depressive symptoms in a student sample.

2.2.2 *Response styles theory (RST)*

In a seminal paper which outlined RST, Nolen-Hoeksema (1991, p.569) proposed that ‘the way people respond to their own symptoms of depression influences the duration of those symptoms’. More specifically, RST predicts that ruminative responses to feeling down, sad or depressed, defined as focusing attention on one’s depressive symptoms and on the implications of those symptoms, increases vulnerability to the onset of new depressive episodes and prolongs episode duration. Fundamentally, RST differs from earlier cognitive accounts of depression (Beck, 1983; 1987) because it emphasizes the style, rather than content, of negative cognition. Moreover, in contrast to diathesis-stress models, RST explains the occurrence of depression in the absence of life events/stressors.

RST specifies four mechanisms by which rumination increases vulnerability to depression. First, RST predicts that rumination increases the likelihood that depressed mood will negatively bias thinking and memory recall, adversely affecting how individuals interpret their current circumstances. Second, RST predicts that rumination interferes with problem solving, partly by making thinking more pessimistic and fatalistic. Third, RST predicts that rumination interferes with instrumental behaviour, increasing stressful circumstances. Fourth, RST predicts that rumination leads to an erosion of social support.

2.2.2.1 *Rumination and the course of depression*

There is a substantive body of empirical evidence which is consistent with the hypothesis that rumination predicts the onset and course of depression. First, findings from experimental studies have demonstrated that induced rumination enhances

depressed mood whereas, conversely, engaging in distraction reduces depressed mood (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993). Second, rumination has been found to prospectively predict the onset of new depressive episodes in non-depressed individuals after controlling for baseline depressive symptoms (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Spasojević & Alloy, 2001) and current episode duration in those who are already depressed (Kuehner & Weber, 1999; Robinson & Alloy, 2003). Moreover, rumination has also been found to prospectively predict increased depressive symptoms in adolescents (Hankin, 2008; Skitch & Abela, 2008) and children (Abela, Brozina, & Haigh, 2002).

Although the evidence is broadly consistent with the RST hypothesis that rumination predicts the onset and course of depression, findings from a number of studies indicate that rumination does not reliably predict current episode duration, after controlling for baseline depression (Just & Alloy, 1997; Lara, Klein, & Kasch, 2000; Nolen-Hoeksema, 2000). Interpreting these findings, Nolen-Hoeksema, Wisco, and Lyubomirsky (2008) speculate that different maintaining factors might perpetuate depression in those who are already clinically depressed, compared to those which trigger onset of a new episode. Alternatively, they argue that these discrepant results might be due to the diminishment of statistical power which occurs with the increasing homogeneity of rumination in currently depressed samples.

Consistent with diathesis-stress models of depression, Nolen-Hoeksema, et al. (1994) found that recently bereaved individuals with an elevated tendency to ruminate had higher levels of depression six months later than those who did not engage in rumination. Similarly, in another longitudinal study (Nolen-Hoeksema & Morrow, 1991)

students who reported elevated levels of depression, stress levels, and rumination before a naturally occurring disaster (the Loma Prieta earthquake) were more likely to report increased stress and depression following this traumatic event (ten days and seven weeks post event).

Rumination has also been investigated as a mechanism which interacts with other cognitive diatheses to predict depression. Ciesla and Roberts (2002) found that negative cognitive style interacted with rumination to predict change in depressive symptoms. In another longitudinal study, negative cognitive styles (negative inferential styles and dysfunctional attitudes) interacted with stress-related rumination, in an initially non-depressed student sample, to predict onset, number and duration of depressive episodes over a two and a half year follow up (Robinson & Alloy, 2003). In this study, stress reactive rumination predicted future depressive episodes in those with high, but not low, levels of negative cognitive styles.

2.2.2.2 Rumination, negative thinking and memory

Consistent with RST, converging empirical evidence suggests that rumination enhances negative thinking. Thus, rumination is correlated with increased negative attributional style (i.e., the tendency to endorse global, stable and internal attributions for failure events) and dysfunctional beliefs (Lam, et al., 2003). Moreover, increasing self-focus (characteristic of rumination) diminishes the adaptive tendency to endorse internal attributions for success events (Greenberg, Pyszczynski, Burling, & Tibbs, 1992). Similarly, using a 'think-out-loud' methodology, Lyubomirsky, Tucker, Caldwell, and Berg (1999) found that the expressed thoughts of dysphoric individuals induced to ruminate were significantly more negative in tone than those of dysphoric individuals

who responded to distracting items (with 'dysphoric' defined as scoring > 12 on the Beck Depression Inventory, BDI, Beck, Steer, & Brown, 1996), and that 'dysphoric ruminators' expressed significantly more self-blame and self-criticism, reduced self-confidence and optimism, and less general perceived control than both 'dysphoric distractors' and non-dysphoric individuals.

Experimental studies implicate rumination in a range of depressogenic attentional and cognitive biases and memory impairment: a) trait rumination is associated with an attentional bias towards negative stimuli (Donaldson, Lam, & Mathews, 2007) and decreased positive attentional bias (Morrison & O'Connor, 2008); b) relative to distraction, rumination impairs tasks associated with inhibitory processes (Philippot & Brutoux, 2008; Watkins & Brown, 2002), c) rumination is associated with diminished cognitive flexibility and poor inhibition (Davis & Nolen-Hoeksema, 2000; Joormann, 2006; Philippot & Brutoux, 2008; Whitmer & Banich, 2007) d) rumination impairs concentration on academic tasks relative to distraction (Lyubomirsky, Kasri, & Zehm, 2003).

Rumination is also implicated in depressogenic memory bias and impairment: a) relative to distraction, rumination maintains maladaptive over-general memory retrieval in depression (Crane, Barnhofer, Visser, Nightingale, & Williams, 2007; Raes, Watkins, Williams, & Hermans, 2008; Sutherland & Bryant, 2007; Watkins & Teasdale, 2001; Watkins, Teasdale, & Williams, 2000); b) rumination contributes to the increased recall of negative self-referent material (McFarland, Buehler, von Ruti, Nguyen, & Alvaro, 2007; Moulds, Kandris, & Williams, 2007); c) individuals induced to ruminate recalled increased negative autobiographical memories compared to those who distracted

(Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998).

2.2.2.3 Rumination, problem solving and instrumental behaviour

Consistent with the RST prediction that rumination interferes with instrumental behaviour, findings from a series of experimental studies (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, et al., 1999) showed that dysphoric individuals who were induced to ruminate generated fewer and less effective solutions to interpersonal problems than non-dysphoric individuals and dysphoric individuals who distracted. Moreover, dysphoric individuals in the rumination condition reported significantly less motivation to implement problem solutions than dysphoric participants in the distraction condition, and non-dysphoric participants in either condition. Similarly, Ward, Lyubomirsky, Sousa, and Nolen-Hoeksema (2003) compared how high ruminators and low ruminators performed when they were asked to evaluate a self-generated plan to revise a university housing system. They found that ruminators tended to be less satisfied with the plans they devised, less confident about their plans and less likely to commit to implementing them than low ruminators. In another study, which investigated the effect of rumination on seeking diagnosis for a potentially life-threatening health problem, Lyubomirsky, Kasri, Chang, and Chung (2006) found that high ruminators were significantly more likely than low ruminators to delay seeking medical assistance responding to a vignette scenario (finding a breast lump), and that ruminative breast cancer survivors, who provided retrospective accounts of time to seek diagnosis, took on average 39 days longer to see a healthcare professional than low ruminators.

2.2.2.4 Assessing rumination

Rumination is commonly assessed using the Ruminative Responses Scale (RRS,

Appendix 2) of the Response Style Questionnaire (RSQ, Nolen Hoeksema, 1991). The RRS assesses the tendency to ruminate in response to depressed mood. Participants rate what they generally do when feeling down, sad, or depressed. Items assess frequency (almost never, sometimes, often, almost always) of dwelling on the symptoms of depression (e.g., think about how alone you feel), the causes of depressed mood (e.g., think ‘what am I doing to deserve this?’ and ‘why do I have problems that other people don’t have?’) and its potential consequences (think ‘I won’t be able to do my job/work because I feel so bad’).

Subsequent psychometric analyses of the RRS have been undertaken in order to investigate concerns about its overlap with depressive symptoms (Roberts, et al., 1998; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Roberts et al. identified a three factor solution, ‘symptom focused rumination’ (e.g., think about how passive and unmotivated you feel’), Introspection/self-isolation (e.g., Go someplace alone to think about the reasons you feel sad) and self-blame (e.g., think ‘why do I always react this way). They found that previously depressed individuals exhibited significantly higher levels of all three sub-types of rumination. However, Treynor et al. argued that because one factor in Roberts et al.’s solution was confounded with depression it cannot be claimed that whole scale is not confounded.

Importantly, in a subsequent factor analysis of the RSQ on a large sample, Treynor, et al. (2003) found two distinct factors, after removing items which overlapped with depressive symptoms: a maladaptive factor labelled brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’, and a more adaptive reflection factor, defined as actively attempting to gain insight into problems

(Treyner et al., p.256). Importantly, brooding, but not reflection, has been found to prospectively predict depression in both adult (Treyner, et al.) and adolescent (Burwell & Shirk, 2007) samples.

2.2.3 Control theory and reduced concreteness hypothesis

Control theory (Carver & Scheier, 1981) provides an alternative theoretical conceptualisation of rumination which is more inclusive than RST, accommodating the potential adaptive and maladaptive consequences of rumination. Control theory assumes that increased self-focus occurs in response to an identified goal discrepancy (either internal or external), and that ruminative thinking occurs when there is limited progress towards goal attainment. From this perspective, rumination is defined more broadly as ‘a class of conscious thoughts that revolve around a common instrumental theme and that recur in the absence of immediate environmental demands requiring the thoughts’ (Martin & Tesser, 1996, p.7).

Control theory assumes that personal goals are organized hierarchically with abstract, superordinate, goals (e.g., attain happiness) guiding specific, concrete, and subordinate goals, and with processing at the abstract and concrete levels within the goal hierarchy varying according to specific task and situation demands. Watkins (2008, p.192) argued that, pathological rumination occurs when individuals can neither make progress towards nor abandon a goal, which is more likely when an abstract goal is pursued. Control theory predicts that disengagement from pursuing abstract goals is more difficult because they are more likely to be linked to views of self, and because it is more difficult to ascertain when goal attainment has been achieved.

Reduced concreteness theory (Stöber, 1998) proposed that abstract thinking

(defined as ‘indistinct, cross-situational, equivocal, unclear, aggregated’, in contrast to concrete thinking defined as ‘distinct, situationally specific, unequivocal, clear, singular’ Stöber & Borkovec, 2002, p.92) is a factor which maintains worry, by impeding problem solving (limiting the production of detailed elaborations necessary to generate plans and guide actions necessary for goal attainment) and inhibiting emotional processing (minimising the generation of imagery produced responding to difficulties and associated physiological and emotional responses). More recently, Watkins and Moulds (2007) proposed that the reduced concreteness theory of worry also applies to rumination. Moreover, Watkins (2008, p.193) argued that the control theory approach is compatible with the RST conceptualisation of rumination because ‘focus on the causes and consequences of depressed mood is likely to involve focus on unresolved goal discrepancies’. Indeed, as noted by Watkins (2008), goal attainment is implicit within the definition of brooding, the most maladaptive component of rumination (the passive comparison of one’s current situation with an unachieved standard).

2.2.3.1 Rumination and goal attainment

Findings from a number of empirical studies are consistent with the idea that rumination is linked to problematic goal attainment. Millar, Tesser, and Millar (1988) found that the level of disruption in activities with a significant other after leaving college was associated with ruminative thoughts about that person. In another study, Lavalley and Campbell (1995) found that students who completed a daily diary tracking goal pursuit, negative affect, and rumination, reported increased rumination and negative affect after goal-relevant negative events, compared to negative events which were not goal-related. Similarly, McIntosh, Harlow, and Martin (1995) demonstrated that individuals who

linked lower level goals to the attainment of higher order goals reported more rumination than those who did not link goals in this way. In a recent experience-sampling study, Moberly and Watkins (2009) measured negative affect, ruminative self-focus, and goal appraisals at random intervals (eight times daily for one week) in a predominately female student sample. Consistent with a control theory account of rumination, they found that participants reported higher levels of ruminative self-focus (problem focused rumination, but not symptom focused rumination) when reporting low level of goal success and when pursuing important goals.

2.2.3.2 Rumination and reduced concreteness

Watkins and colleagues have undertaken a range of experimental studies to test the applicability of the reduced concreteness hypothesis to rumination. These have investigated the impact of manipulating processing mode on autobiographical memory, emotional reactivity to stress, and problem solving. Watkins and Teasdale (2001) devised an experimental method which enabled manipulating concreteness of thinking and degree of self-focus during rumination (In the ‘high-self focus-high-analysis’ condition participants were asked to focus attention on thoughts that were symptom-focused, emotion-focused and self-focused, e.g., ‘think about the possible consequences of the way you feel’. In the ‘high-self focus-low analysis’ condition, participants were instructed to focus attention on the experience of depressive symptoms. In the ‘low self-focus-low analysis’ condition, participants focused on items that were externally focused, e.g., ‘think about the shape of a large black umbrella’. In the low self-focus-high analysis condition, participants focused on abstract and philosophical ideas, e.g., ‘think about trying to understand the world that you live in’. Providing support for the reduced

concreteness hypothesis, increased self-focus was associated with increased negative mood whereas reducing analytical self-focus resulted in less over-general memory-recall.

Experimental findings have also demonstrated the effect of processing mode on emotional reactivity to stress. First, Watkins (2004) found that inducing an abstract or concrete processing mode following an induced failure on a Remote associates test (in the abstract-evaluative condition participants were asked to write about the causes, reasons and meanings for their performance; in the concrete condition, participants were asked to write about the direct experience of their performance and their feelings including their mental processes and use of their experience as a guide to solutions) influenced subsequent decreases (i.e., recovery) in negative mood. As predicted, high trait disposition to ruminate was associated with increased negative affect in the conceptual-evaluative (abstract processing) condition compared to the concrete processing condition. In a follow-up to this study, Moberly and Watkins (2006) found that inducing abstract and concrete processing modes prior to experiencing an upsetting/stressful event (failure version of the Remote Associates Test), influenced how individuals subsequently responded to the event. Higher levels of trait rumination were associated with lower levels of positive affect for participants in the abstract but not the concrete condition.

Consistent with the reduced concreteness hypothesis prediction, manipulation of concreteness has also been found to influence problem solving. Watkins and Moulds (2005) found that, relative to inducing an abstract mode of ruminative self-focus, inducing a concrete processing mode significantly increased problem solving

effectiveness, and that change in concreteness mediated the effect of ruminative self-focus on change in problem solving in depressed individuals. In a more recent study, Watkins and Moulds (2007) demonstrated that currently depressed individuals provided less concrete descriptions of problems than previously depressed and never depressed participants.

2.2.4 Clinical treatment of rumination in depression

Highlighting the clinical relevance of understanding the role of rumination in depression, Pyszczynski and Greenberg (1987, p.134) argued that ‘one important goal of therapy should be eliminating the depressive self-focusing style’. There are currently a diverse range of therapeutic modalities that target rumination. These include behavioural activation (BA, Jacobson, Martell, & Dimidjian, 2001), Rumination-focused cognitive behaviour therapy (RFCBT, Watkins et al., 2007), Concreteness training (Watkins, Baeyens, & Read, 2009), mindfulness-based cognitive therapy (e.g., Kuyken, et al. 2008) and expressive writing (Pennebaker, 1997; Pennebaker & Seagal, 1999).

BA is a behavioural treatment for depression which attempts to help depressed people to re-engage with their lives (Dimidjian, Martell, Addis, & Herman-Dunn, 2008). BA applies a functional-analytic perspective, which focuses on first identifying and understanding the function of rumination as an avoidance behaviour which prevents people from engaging fully with their activities and environments. Addressing ruminative thinking within a BA framework involves assessing the context and consequences of rumination. As an alternative to rumination, patients are encouraged to practice focusing attention on a current activity and surroundings. Findings from randomized controlled trials indicate that BA is an effective treatment for depression (Dimidjian, et al., 2006).

However, whilst the BA treatment explicitly targets rumination, to date there is no available empirical evidence which confirms that BA reduces rumination.

Rumination-focused cognitive behaviour therapy (RFCBT, Watkins et al. 2007) is a treatment intervention which specifically targets ruminative thinking. Like BA, this therapeutic approach involves identifying and understanding the context and function of rumination, as a starting point for helping patients to recognise warning signs for rumination, to develop and implement alternative strategies, and to alter behavioural and environmental contingencies which are maintaining rumination (Watkins et al., 2007). In addition, RFCBT also targets the abstract-evaluating thinking which characterizes rumination. Experiential/imagery exercises and behavioural experiments are used to help individuals shift into a more helpful, concrete, and focused mode of thinking. Preliminary findings, from a case series study with patients with residual depression, indicated that RFCBT significantly reduces depression (as measured using the Beck Depression Inventory, BDI, Beck, Beck, Steer, & Brown, 1996 and Hamilton Rating Scale for Depression, Hamilton, HRSD, 1960, Williams, 1988) and maladaptive rumination. However, it is not known whether the effectiveness of RFCBT in reducing rumination and depression are due to its elements in common with BA, or its novel focus on shifting thinking style.

Concreteness training (Watkins, Baeyens, & Read, 2009; Watkins & Moberly, 2009) is a (related) therapeutic modality which evolved from experimental findings which indicate that training individuals to adopt concrete construals reduces emotional reactivity to failure (Moberly & Watkins, 2006; Watkins, Moberly, & Moulds, 2008). In concreteness training, individuals are instructed in how to actively generate concrete

construals (focusing on the specific details of an event, on what makes each event unique, and on the process of how it happened) when imagining emotional events, using audio recordings to facilitate daily practice. Preliminary findings from a proof-of-principle study found that concreteness training significantly reduced depressive symptoms and rumination, compared to a waiting list condition (Watkins, Baeyens & Read, 2009).

Mindfulness meditation has also been found to reduce rumination (Deyo, Wilson, Ong, & Koopman, 2009; Jain, et al., 2007). First, in a sample of individuals with a lifetime history of mood disorders, mindfulness based stress reduction (MBSR) led to decreases in rumination, even after controlling for reductions in affective symptoms and dysfunctional beliefs, compared to a wait list control (Ramel, Goldin, Carmona, & McQuaid, 2004). Second, in a sample of nursing professionals, randomly allocated to complete a course of mindfulness meditation or an advanced leadership training course (focused on stress reduction), there was a significant decline in rumination in those who completed the mindfulness course (Bortz, Summers, & Pipe, 2007). Third, in a pilot study (with no control group), Deyo et al. (2009) found that a self-selected adult sample, with various medical and psychological problems, reported increased mindfulness and reduced rumination after an eight week course of mindfulness based stress reduction (MBSR). Fourth, in a randomized controlled trial (Jain, et al., 2007), in which students were allocated to one month of mindfulness training, somatic relaxation training or a control group, those in the meditation group exhibited significant pre-post decreases in distractive and ruminative thoughts compared to the control group.

Preliminary findings indicate that expressive writing about negative or stressful experiences (e.g., Pennebaker, 1997; Pennebaker & Seagall, 1999) may be an alternative

technique for reducing rumination. Gortner, Rude, and Pennebaker (2006) hypothesised that expressive writing facilitates the processing and organisation of emotional material, which would otherwise fuel ruminative thinking. As predicted, depression vulnerable students (previously depressed individuals, with a tendency to engage in thought suppression) who spent 15-20 minutes a day writing about upsetting emotional experiences over three consecutive days, reported significantly reduced brooding compared to those in a control condition (who wrote about superficial topics, e.g., time management). Interestingly, brooding increased amongst those with low suppression who engaged in expressive writing. In another study, brooding moderated the effect of expressive writing on depressive symptoms: Sloan, Marx, Epstein, and Dobbs (2008) conducted a study in which participants were either allocated to an expressive writing condition, in which they were asked to write about the most stressful experience of their lives with as much emotion and feeling as possible for 20 minutes over three consecutive days, or a control condition in which they were asked to write about how they spent their time each day without any emotions (for the same time period). Sloan et al., (2008) found that brooding moderated the effect of condition on future depressive symptoms, whereby participants in the expressive writing condition with a greater tendency to engage in brooding reported a significant decrease in depressive symptoms.

2.2.5 Interim summary: Rumination

In summary, the existing research provides a range of evidence which indicates that rumination is a key vulnerability factor for depression and that it has a range of adverse consequences associated with impairment in attention, perception, and cognition. Taking account of these combined findings, it can be hypothesised that rumination might

also contribute to social adjustment difficulties and interpersonal problems in depression by: a) negatively biasing how individuals interpret and respond to social cues; b) impairing interpersonal problem solving; c) decreasing motivation, increasing passivity and inhibiting adaptive interpersonal behaviour. Before considering theory and empirical evidence which suggests a link between rumination, social functioning and interpersonal problems in depression, it is first necessary to outline the interpersonal context of depression, drawing on relevant research findings in this area and considering relevant theoretical models.

2.3 The interpersonal context of depression

2.3.1 Depression and impaired social adjustment

There is considerable consensus in the literature that depression is associated with impairment in social adjustment (Hirschfeld, et al., 2000; Joiner, 2000; Tse & Bond, 2004). In a seminal study, Weissman and Paykel (1974) found that depressed women exhibited significant and persistent social functioning difficulties across multiple domains (work, social and leisure activities, extended family and marital relationships) compared to non-depressed controls. Similarly, in a large community sample (Wells, et al., 1989), depressed outpatients experienced significant psychosocial impairment, comparable or worse than that experienced by individuals with chronic medical conditions. In another epidemiological study (Fredman, Weissman, Leaf, & Bruce, 1988) individuals with a current major depressive episode (MDE) reported significantly poorer quality interpersonal relationships and less satisfying social interaction than those with past depression, other psychiatric disorders, and never depressed controls.

Research that has assessed the association between social adjustment and

depressive symptoms in depression-vulnerable individuals, indicates that: a) psychosocial impairment varies as a function of depressive symptom severity (Ormel, et al., 1993; VonKorff, Ormel, Katon, & Lin, 1992); b) treatments for depression improve social adjustment (Coulehan, Schulberg, Block, Madonia, & Rodriguez, 1997; Scott, et al., 2000); and c) that psychosocial impairment in depression persists beyond the recovery from core depressive symptoms (Bothwell & Weissman, 1977; Coryell, et al., 1993; Furukawa et al., 2001; Hirschfeld, et al., 2002; Paykel & Weissman, 1973). Ormel, Oldehinkel, Nolen, and Vollebergh (2004) assessed psychosocial functioning across three time points in a large psychiatric sample, which included individuals who experienced both first and recurrent episodes of major depression. Consistent with the hypothesis that psychosocial impairment is a manifestation of state depressive factors, levels of impairment were significantly higher within episode (for both first and recurrent major depressive episode participants). However, significant differences in psychosocial adjustment were also found between the remitted first MDE group and the never MDE group, indicative of moderate trait effects.

Moreover, findings from numerous studies indicate that supportive relationships can potentially confer protective benefits to depression vulnerable individuals. In a seminal psychological and sociological study into the origins of depression, Brown and Harris (1978) demonstrated that being in a close, confiding relationship is a key protective factor for depression. More recently, Harris (2001) proposed that positive psychosocial situations might represent a 'pathway to remission'. Consistent with this hypothesis, findings from two randomized controlled trials indicate that social support contributes to depression remission (Blanchard, Wattereus, & Mann, 1999; Harris,

Brown, & Robinson, 1999).

Understanding that social functioning impairment is associated with depression has stimulated interest in methods for assessing and treating depression which extend beyond a focus on core depressive symptoms (Bosc, 2000; Healy, 2000; Healy & McMonagle, 1997). Numerous interview and questionnaire measures have been developed to assess social functioning (for a detailed review see Schmidt, Garratt, & Fitzpatrick, 2000). Of these, the Social Adjustment Scale-Self-Report (SAS-SR, Weissman, 1999, Appendix 2) is a widely used measure, which was developed as an assessment tool for use in a clinical trial of antidepressant drugs and psychotherapy for depressed patients. In subsequent systematic reviews, the SAS-SR has been deemed suitable as a research tool (Schmidt et al., 2000). The scale has demonstrated discriminant validity, distinguishing between community, depressed, and other psychiatric samples (Weissman et al., 1978), and predicting the response of depression to an anti-depressant treatment (Friedman, Parides, Baff, Moran, & Kocsis, 1995). The SAS-SR has also been validated by comparison with interviewer assessment of depressed patients (Weissman & Bothwell, 1976). Moreover, unlike some measures of social adjustment, primarily intended as clinical tools (e.g. Short form health survey, SF-36, Ware & Sherbourne, 1992), the SAS-SR does not confound social functioning with physical functioning.

2.3.2 Interpersonal factors confer vulnerability to depression

The following section describes key theoretical models which propose potential forms of interpersonal vulnerability to depression, reviews the current empirical evidence underpinning these theories, and outlines relevant assessment methods. The theoretical models described are: a) adult attachment theory (Brennan, Clark, & Shaver, 1997;

Hazan & Shaver, 1987; Shaver & Hazan, 1987); b) Coyne's (1976a, 1976b) interactional model of depression; c) evolutionary (Gilbert, Allan, & Trent, 1995) and behavioural (Ferster, 1973; Lewinsohn, 1974) models which have emphasized the role of submissiveness and avoidance in depression; d) stress generation models of depression (Hammen, 1991, 2006).

2.3.2.1 Adult attachment style and rejection sensitivity

Extending Bowlby's (1958, 1969, 1973, 1980) seminal work on child attachment, adult attachment theory (Brennan, et al., 1997; Hazan & Shaver, 1987) assumes that romantic relationships in adulthood are influenced by internalized working models of self and other (i.e., cognitive representations about the self as unworthy of love and/or others as untrustworthy/unreliable), derived from early experiences with caregivers. A range of different conceptualisations of adult attachment style have been proposed (for a review see Brennan et al., 1998). However, psychometric analysis (based on a factor analysis of 14 self-report inventories of attachment, Brennan et al., 1998) indicated that two underlying dimensions of attachment anxiety, reflecting a) underlying rejection and abandonment fears, and b) attachment avoidance incorporating discomfort with closeness, underpin all of these. Because depressed individuals characteristically hold a negative view of self, it has been hypothesised that depression is associated with high scores on the anxious attachment dimension (Carnelley, Pietromonaco, & Jaffe, 1994). Adult attachment theory makes less clear predictions about the relationship between depression and the avoidant attachment dimension (Carnelley, et al., 1994).

Downey and Feldman (1996) argued that attachment researchers have given inadequate attention to investigating the specific mechanisms linking early rejection

experiences with later interpersonal functioning. They proposed that individuals who have early experiences of rejection develop a heightened sensitivity to later rejection. Downey and Feldman (p.1329) operationalized rejection sensitivity as, ‘generalised expectations and anxiety about whether significant others will meet one’s needs for acceptance or will be rejecting’, and hypothesised that anxiously attached individuals who enter relationships with the expectation of rejection are likely to: a) perceive rejection in ambiguous behaviours; b) feel insecure and unhappy about their relationships and; c) respond to perceived rejection or threats with hostility, diminished support or controlling behaviour. Importantly, Ayduk, Downey, and Kim (2001) argued that this rejection sensitivity is a vulnerability factor for depression.

Findings from a range of empirical studies indicate that anxious attachment style is associated with depression in clinical (Carnelley, et al., 1994; Cyranowski, et al., 2002; Pettem, West, Mahoney, & Keller, 1993) and non-clinical (Besser & Priel, 2008; Carnelley, et al., 1994; Murphy & Bates, 1997) samples. Moreover, emerging evidence from longitudinal studies is consistent with the hypothesis that anxious attachment is a vulnerability factor for depression. First, in a longitudinal study, which used a sample of women at high risk for depression (Bifulco, Moran, Ball, & Bernazzani, 2002), marked/moderate levels of fearful attachment style (characterised by high anxiety and high avoidance) prospectively predicted the onset of new episodes of depression within a three year follow-up period. Second, in a series of three prospective studies (Hankin, Kassel, & Abela, 2005), anxious (and avoidant) attachment styles prospectively predicted depressive symptoms in a student sample. Third, Hammen et al. (1995) found a significant interaction between anxious attachment and interpersonal stressors predicting

fluctuations in depressive symptoms over one year in a sample of recent graduates.

Consistent with its conceptualisation as a risk factor for depression, Ayduk et al. (2001) found that rejection sensitivity predicted increased depressive symptoms following a rejection event (partner initiated break-up) in a sample of female undergraduates. In a more recent study (Ehnvall, Mitchell, Hadzi-Pavlovic, Malhi, & Parker, 2009), rejection sensitivity was positively correlated with depression in a sample of depressed outpatients. Interestingly, rejection-sensitivity was associated with increased chest pain, headaches, and body pain during depression. Drawing on findings from fMRI studies, Ehnvall et al., (2009) proposed that the same brain regions are implicated in the experience of physical pain, the perception of social rejection, and depressive states and behaviour.

2.3.2.2 Assessment of adult attachment style and rejection sensitivity

Fraley, Waller, and Brennan (2000) conducted an ‘item response theory’ analysis on 323 items drawn from 14 self report inventories of attachment. From this, they concluded that the Experiences in Close Relationships questionnaire (ECR, Brennan, Clark, & Shaver, 1998, and subsequent revised version which emerged for this psychometric analysis, ECR-R, Fraley, et al. 2000, Appendix 2) exhibited the best psychometric properties. The ECR-R is a 36-item questionnaire which measures the two dimensions of attachment style in romantic relationships: avoidance (discomfort with closeness and dependency; e.g., “I prefer not to show a partner how I feel deep down”) and anxiety (fear of abandonment; e.g., “I’m afraid that I will lose my partner’s love”). Individuals rate each item on a 7-point scale (1, disagree strongly – 7, agree strongly). Both sub-scales have demonstrated good internal consistency (Fraley, et al. 2000).

Downey and Feldman (1996) developed the (adult) rejection sensitivity questionnaire (ARSQ, Appendix 2) drawing on interview data collected from a sample of students (invited to discuss what they thought would happen and how they would feel in a range of interpersonal situations). The ARSQ consists of nine hypothetical situations involving interactions with partner, family, friends, and strangers, with the potential for rejection (e.g., “Lately, you’ve been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong”). Individuals rate the degree to which they are concerned about rejection and degree of anticipatory anxiety about rejection on two 6-point scales, with a composite rejection sensitivity score calculated by multiplying these ratings, and a total rejection sensitivity score computed as the mean of these composite scores.

2.3.2.3 Depression and excessive reassurance-seeking

Coyne (1976a, 1976b) argued that those vulnerable to depression are likely to engage in excessively seeking reassurance from other people to bolster a diminished sense of self-worth and to provide assurance that they are loved. Coyne further hypothesised that depressed individuals are likely to doubt the sincerity of reassurance provided by close others (attributing it to others’ sense of pity and/or obligation), triggering a negative spiral in which excessive reassurance-seeking behaviour generates increasingly negative and rejecting responses from frustrated partners. Fundamentally, Coyne proposed that excessive reassurance-seeking contributes to the maintenance and exacerbation of depression, due to the associated disruption of the depressed person’s interpersonal environment. Encapsulating the core component of Coyne’s interactional model, excessive reassurance-seeking has been conceptualised as ‘the relatively stable

tendency to excessively and persistently seek assurances from others that one is lovable and worthy, regardless of whether such assurances have already been provided' (Joiner, Metalsky, Katz, & Beach, 1999, p. 270).

Empirical evidence that excessive reassurance-seeking is a risk factor for depression includes findings from a range of studies in which excessive reassurance-seeking was associated concurrently with increased depressive symptoms (in undergraduate students, Joiner, Alfano, & Metalsky, 1992, 1993; Joiner & Metalsky, 1995, 2001; Potthoff, Holahan, & Joiner, 1995; air force cadets, Joiner & Schmidt, 1998; veteran administration inpatients, Joiner, Metalsky, Gencoz, & Gencoz, 2001; and dating women, Katz, Beach, & Joiner, 1998; Katz & Beach, 1997). Excessive reassurance-seeking has also demonstrated diagnostic and symptom specificity to depression (Burns, Brown, Plant, Sachs-Ericsson, & Joiner, 2006; Joiner & Metalsky, 2001; Joiner, et al., 2001; Joiner & Schmidt, 1998). Moreover, excessive reassurance-seeking and has been found to prospectively predict increased depressive symptoms in longitudinal studies. First, in an ethnically diverse student sample (Davila, 2001), excessive reassurance-seeking predicted increased depressive symptoms six months later, controlling for baseline depression status and insecure attachment style. Second, Joiner and Schmidt (1998) found that excessive reassurance-seeking prospectively predicted increased depressive symptoms five weeks later in a large sample of air-force cadets. Third, in a study of dating women, excessive-reassurance seeking moderated the effect of partner devaluation on depression six weeks later (Katz et al., 1998).

2.3.2.4 Assessment of excessive reassurance-seeking

The Depressive Interpersonal Relationships Inventory – Excessive reassurance-

seeking sub-scale (DIRI-ERS, Appendix 2) is a four-item sub-scale of the DIRI (the other sub-scales include general dependency, need for approval, doubting others sincerity) which measures frequency of engaging in excessive reassurance-seeking behaviours (e.g., “In general, do you find yourself often asking the people you feel close to how they truly feel about you?”) on a seven-point scale (1, no, not at all – 7, yes, very much). Previous psychometric analyses have demonstrated the ERS to be a cohesive interpersonal factor with internal consistency, factorial rigour, discriminability, and convergent validity (Joiner & Metalsky, 2001). The DIRI-ERS has frequently been used as an independent measure of excessive reassurance-seeking (e.g., Joiner & Schmidt, 1998; Katz, et al., 1998, Potthoff, et al., 1995; Holahan & Joiner, 1995; Shaver et al., 2005).

2.3.2.5 Depression and submissive, passive, and avoidant behaviour

Gilbert et al. (1995) argued that the dimension of social rank (dominance versus subordination/submissiveness) is of particular importance to the study of depression. Social rank theory (Gilbert, 1992; Gilbert, Allan, Brough, Melley, & Miles, 2002; Price, Sloman, Gardner, Gilbert, & Rohde, 1997; Sloman, Price, Gilbert, & Gardner, 1994) focuses on issues of social power in relationships and submissive behaviour in depression. Gilbert (1992) proposed that, from an evolutionary perspective, depressed states represent a primitive form of social defence in response to others who are more powerful or of higher rank (subsequently labelled Involuntary Defeat Strategy, IDS, Zuroff, Fournier, & Moscovitz, 2007), which evolved to prevent individuals engaging in potentially dangerous contests with more powerful rivals. This model assumes that individual differences in vulnerability to depression reflect differences in the way that individuals respond to challenges and threat within their social environment.

Similarly, behavioural theories (Ferster, 1973; Lewinsohn, 1974) have emphasized the role of passivity and avoidance in depression. Ferster (1973) assumed that depression results from a learning history in which an individual's actions do not receive positive reinforcement from the environment, or in which actions are reinforced because they allow escape from aversive conditions. Ferster proposed that decreased response-contingent positive reinforcement leads to an increased turning inwards (i.e., focus on self rather than possible positive reinforcement in the environment) and a narrowing in the individuals repertoire of adaptive behaviours. Thus, due to the diminishment in positive reinforcement from the external environment, individuals are likely to adopt an increasingly passive interpersonal style (and also in terms of increased self-focus, an increasing ruminative cognitive style). Consistent with both the evolutionary and behavioural models of depressions, Joiner (2000) further hypothesised that conflict avoidance, rather than generalised avoidance, is characteristic of depressed individuals because assertiveness, necessary for conflict resolution, is particularly problematic for depressed individuals.

Consistent with these evolutionary and behavioural models of depression, findings from a range of studies indicate that depression is correlated with submissive behaviour (Allan & Gilbert, 1997; Cheung, Gilbert, & Irons, 2004; Irons & Gilbert, 2005), low assertiveness (Hirschfeld, Klerman, Clayton, & Keller, 1983; Segal, 2005; Youngren & Lewinsohn, 1980), perceived lack of control over social situations (Nezlek, Hampton, & Shean, 2000) and avoidance (Ottenbreit & Dobson, 2004). In their review of the literature, Barnett and Gotlib (1988) concluded that remitted depressed individuals were less sociable, dominant, active and lower in social self-confidence than never

depressed controls. Moreover, findings from a number of longitudinal studies indicate that low levels of assertiveness and avoidance prospectively predict increased depression. First, Sanchez and Lewinsohn (1980) found that low levels of emitted assertive behaviour predicted next day depression in a small inpatient sample. Second, in a sample of non-depressed patients with panic disorder, reduced assertiveness predicted increased depression two years later (Ball, Otto, Pollack, & Rosenbaum, 1994). Third, Holahan and Moos (1986) found that a disinclination to use avoidant coping (in combination with other variables) was associated with reduced risk of depression over a one year period in a community sample. Fourth, avoidance coping was associated with lack of remission status in a sample of individuals presenting for treatment of depression (Krantz & Moos, 1988).

2.3.2.6 Assessing submissiveness and other maladaptive interpersonal behaviours

The interpersonal circumplex approach conceptualizes interpersonal behaviour as a function of the two dimensions of dominance and affiliation/love (Horowitz & Vitkus, 1986). The circumplex model assumes that different interpersonal behaviours reflect the joint influence of these two underlying orthogonal constructs, and that a circular ordering of variables about the dimensions of dominance and affiliation provides a holistic representation of interpersonal behaviours. Alden and Bieling (1996, p. 63) argued that ‘A circumplex analysis offers the advantage of simultaneously examining a wide spectrum of interpersonal behaviours in a process that takes the intercorrelations between various interpersonal problems into consideration.’ Thus the interpersonal circumplex model provides a useful framework for an interpersonal analysis of depression.

The Inventory of Interpersonal Problems (IIP-64 and IIP-32, short-version, Alden,

Wiggins, & Pincus 1990, Appendix 2) is a self-report questionnaire based on the circumplex model, with eight subscales derived from the two dimensions of affiliation and dominance: Domineering (e.g., “I try to control other people too much”); Intrusive/Needy (e.g., “I find it difficult to spend time alone”); Self-Sacrificing (e.g., “I put other people’s needs before my own too much”); Overly-accommodating (e.g., “I let other people take advantage of me too much”); Non-assertive (e.g., “I find it difficult to let other people know what I want”); Socially inhibited (e.g., “I am too afraid of other people”); Cold (e.g., “I keep other people at distance too much”); Vindictive (e.g., “I am too suspicious of other people”).

2.3.3 Stress generation in depression

In an elaboration of diathesis-stress models of depression, the stress generation model of depression assumes that those vulnerable to depression are not merely passive recipients of stressors, but that they actively contribute to the stress experienced (Hammen, 1991, 2006), and that this stress generation further contributes to the maintenance of depression. Central to the stress generation model is the distinction between independent stressful events, which are unequivocally outside of the individual’s control (e.g., a family member dies), versus dependent stressful events, to which an individual, at least partially, contributes, such as conflict with close family (Rudolph & Hammen, 1999). Hammen (2006, p.1070) argued that stressful events generated by those vulnerable to depression are ‘not merely the consequences of depressive symptoms but are somehow related to enduring cognitions, traits, behaviours and circumstances’. Thus, understanding stress generation necessitates demonstrating which specific factors explain this process beyond the presence of depression itself.

Findings from a range of studies indicate that stressful life events predict depression in both community (Billings & Moos, 1984; Brown & Harris, 1978; Lewinsohn, Hoberman, & Rosenbaum, 1988) and clinical samples (Swindle, Cronkite, & Moos, 1989). Moreover, as predicted, Hammen (1991) found that women who were currently depressed or recently remitted from depression experienced significantly more dependent event stress and, specifically, dependent interpersonal event stress, than women with chronic medical illness, bipolar disorder, or healthy controls, but that they did not differ in the level of independent event stress experienced. Thus, it appears that an episode of major depression increases the likelihood of future interpersonal dependent stress (i.e., stress generation).

Moreover, Hammen et al. (1995) found that interpersonal stress mediated the effect of initial depressive symptoms on subsequent depressive symptoms (worst recalled onset of depressive symptoms during a one year follow up period) in a sample of female students. Similarly, in a more recent study, Cole, Nolen-Hoeksema, Girgus, and Paul (2006) demonstrated that stress predicts depression (stress exposure), and that depression predicts stress (stress generation) in a large sample of children and adolescents assessed twice yearly over three years.

The stress generation effect (depression predicts future stress) has been replicated in a range of clinical and community samples including men and women (Chun, Cronkite, & Moos, 2004; Cui & Vaillant, 1997; Harkness & Luther, 2001), children and adolescents (Hammen & Brennan, 2001; Rudolph & Hammen, 1999), and older adults (Holahan, Moos, Holahan, Brennan, & Schutte, 2005). Moreover, the stress generation effect has been found both for individuals meeting diagnostic criteria for current or

former depression (Daley et al., 1997; Hammen, 1991), and for those with elevated depressive symptoms (Davila, Hammen, Burge, Paley, & Daley, 1995; Potthoff, et al., 1995). Although this *stress generation effect* of depression was initially demonstrated for discrete life events in women (Hammen, 1991), depression has been repeatedly found to prospectively predict both discrete life events and ongoing chronic stressors (Davila et al., 1995; Holahan et al., 2005).

Findings from longitudinal prospective studies have implicated insecure attachment styles (Hankin et al., 2005) and other interpersonal styles characterised by excessive relationship concerns, sociotropy (Shih, 2006) and dependency (Mongrain & Zuroff, 1994) as mechanisms underlying stress generation in depression. Similarly, excessive reassurance-seeking, and the interpersonal style of being too caring, both predict increased interpersonal stress (Potthoff, et al., 1995; Shih, Abela, & Starrs, 2009; Shih & Eberhart, 2008). Thus, there is convergent evidence that interpersonal vulnerability factors such as excessive reassurance-seeking and insecure attachment predict increased generation of stressful life events.

2.3.3.1 Assessment of life stress

The use of contextual interviews (Brown & Harris, 1978; Hammen, 1991) is seen as the gold standard necessary to enable systematic and objective assessment of life events and chronic stress, and differentiation between dependent and independent events (Hammen, 2006; Roberts & Ciesla, 2007). The Life Events and Difficulties Schedule (LEDS brief version; Bifulco, et al., 1989; Brown & Harris, 1978) is a widely used semi-structured contextual interview that assesses interpersonal events, defined as those which involved an interaction with another person or that directly affected the relationship

between the individual and another person (Rudolph, 2008), and other life events. Emphasis is placed on understanding the specific circumstances surrounding event occurrence. Participants are asked to provide a detailed description of events, including date of occurrence and event duration, relevant contextual factors (e.g., coping resources, event expectedness, prior experience with the event) and event consequences. A 5 point scale is used to assess event impact, with a score of 1 indicating that the event had little or no impact (i.e., essentially positive events) and 5 indicating that the event had very serious consequences (e.g., threat to life of self or close other). Events are also assessed for independence using another 5 point scale from 1 (event completely independent) to 5 (event entirely dependent). The LEDS interview also includes assessment of ongoing difficulties defined as 'problematic situations that last a minimum of four weeks' (Bifulco et al., 1989, p.1). Multiple severity ratings are assigned to difficulties to reflect change points across the interview reporting period (usually one year).

The UCLA life stress interview (Hammen, 2004) is another widely used interview measure of life events and chronic stress adapted from the original LEDS. The UCLA method was intended to be briefer and more streamlined than the original LEDS interview (which takes several hours to administer). Moreover, the UCLA interview incorporates a unique chronic stress assessment procedure. Chronic stress is defined as, 'ongoing conditions over the past six months in each of several areas (Hammen, 2004, p. 3). Areas covered include intimate relationship, close friendships, job, finances, relations with children, relations with extended family members, health of self, health of family members. The level of stress is rated on a 5-point scale by the interviewer, based on behaviourally-specific anchor points on the scale. In contrast to Brown and Harris's

“ongoing difficulties” which involves rating enduring idiographic stresses, the UCLA chronic stress method enables rating all individuals on the same role area dimensions.

2.3.4 Clinical treatment of interpersonal problems in depression

Interpersonal psychotherapy (IPT, Bleiberg & Markowitz, 2008) is an evidence-based and time-limited (12 or 16 weekly sessions) treatment for depression, which is specifically focused on current or recent life events, interpersonal difficulties, and depressive symptoms. The theory was developed from interpersonal theory (Meyer, 1957; Sullivan, 1953) and attachment theory (Bowlby, 1953). A key principle of IPT is that depression is connected to a current or recent interpersonal event. The therapy focuses on current relationships, with a key therapeutic goal being to solve an identified interpersonal problem (e.g., complicated bereavement, role dispute, role transition, maladaptive interpersonal functioning, and labelled ‘interpersonal deficits’) and improve social functioning. IPT focuses on helping individuals to gain awareness of the relationship between mood and interpersonal functioning. Findings from randomized controlled trials indicate that the efficacy of IPT is comparable to CBT for the treatment of depression (Elkin et al., 1989; Luty et al., 2007). IPT is a recommended intervention (for persistent sub-threshold depressive symptoms, mild to moderate depression with inadequate response to initial interventions, and moderate to severe depression) in the National Institute of Health and Clinical Excellence (NICE) guidelines for the treatment and management of depression in adults.

2.3.5 Interim summary: Interpersonal context of depression

In summary, depressed individuals, compared to those who are not depressed,

those with other physical health problems, and other psychiatric disorders are characterised by impaired social adjustment across the domains of partner and familial relationships, social life, and work. Moreover, there is a substantive body of empirical evidence which indicates that interpersonal factors confer vulnerability for depression. Key interpersonal risk factors for depression include underlying fears of rejection and abandonment (evolved from early experiences with care-givers), excessive reassurance-seeking, passive/submissive interpersonal behaviours and increased, self-generated, interpersonal stress.

2.4 Rumination, interpersonal style and poor social adjustment

Given that both rumination and difficulties in interpersonal functioning are identified as major vulnerability factors for depression, which are exacerbated by increased depression, it seems plausible that these factors may be associated. Indeed, a number of theoretical models have suggested that rumination may play a causal role in the development of interpersonal difficulties in depression vulnerable individuals (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004), and that underlying interpersonal vulnerabilities might confer vulnerability to rumination (McBride & Bagby, 2006; Saffrey & Ehrenberg, 2007).

2.4.1 Adverse interpersonal consequences of rumination

Emerging integrated cognitive and interpersonal accounts of depression implicate rumination in the onset and maintenance of maladaptive interpersonal behaviour and poor social adjustment. Providing a theoretical rationale for the current thesis, Joiner (2000, p. 211) proposed that rumination is the cognitive “motor” that drives maladaptive

depressogenic interpersonal behaviours. More specifically, Joiner hypothesised that depression maintenance results from interactions between (i) erosive processes (involving the loss of resources, e.g., diminished optimism); (ii) self-propagatory mechanisms defined as ‘depression- related, initiated and active behaviours’ (Joiner, p.205), and (iii) stable underlying vulnerability factors, such as rumination. Inherent in the term ‘propagation’ is the idea that these mechanisms induce one another. Moreover, in contrast to erosive processes (which involve the loss of resources), the absence of self-propagatory mechanisms is assumed to be helpful. Joiner delineated stress generation, negative feedback seeking (the desire to obtain feedback which matches one’s self-concept), excessive reassurance-seeking, interpersonal conflict avoidance and blame maintenance (negative mental representations held by the partners of depressed individuals guide attention and expectancies) as key self-propagatory mechanisms. Joiner speculated that: a) rumination might fuel excessive reassurance-seeking behaviour by sustaining dysphoric ideation and mood; b) rumination could induce negative feedback seeking by focusing attention on feelings of inadequacy.

In their review of the consequences of rumination, Lyubomirsky and Tkach (2004) conceptualised a vicious cycle between rumination, negative affect, and multiple adverse consequences (depressive symptoms, negatively biased thinking, poor problem solving, impaired motivation and inhibited instrumental behaviour, impaired concentration and cognition and increased stress and problems). Lyubomirsky and Tkach hypothesised that there are multiple possible pathways through which rumination generates adverse interpersonal consequences. For example, ruminative thinking might contribute to interpersonal stresses by promoting self-fulfilling prophecies (e.g., leading

to decision to confront spouse about non-existent marital problems). Summarising this proposed model, Lyubomirsky and Tkach (2004, p.33) argued that ‘by triggering a host of cognitive, motivational, and behavioural deficits, dysphoric ruminators may unwittingly end up exacerbating their problems and elevating their levels of stress, thus further reinforcing their depressive symptoms’.

In an elaboration of this proposed vicious cycle, Tse and Bond (2004) generated five specific hypotheses regarding the role of rumination as a causal factor underlying social functioning impairment in depression: a) rumination results in insufficient cognitive resource being available for effective social perception; b) self-focused attention will reduce cognitive capacity impairing interpersonal problem solving; c) ruminative self-focus will mediate the activation of negative cognitive schemata leading to a negative bias interpreting ambiguous social cues; d) the inward self focus, which characterizes rumination, directs attention away from attending to other people’s needs so that helping others will be viewed as less rewarding and pro-social behaviours will be reduced; e) the recurrent self-examination which characterizes ruminative thinking and the associated activation of feelings of worthlessness will generate excessive reassurance-seeking, fulfilling the needs for self affirmation from others.

Furthermore, conceptualizing ruminative thinking as a maladaptive form of avoidance (Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema et al., 2008; Watkins et al., 2007) suggests that rumination is a mechanism which fuels passive/submissive (i.e., low control) behaviours. Delineating the potential avoidant function of rumination, Nolen-Hoeksema et al. (2008, p.407) argued that ‘rumination serves to build a case that the individual is facing a hopelessly uncontrollable situation and so he or she is not able

to take action to overcome this situation'. Consistent with behavioural models of depression (Ferster, 1973; Lewinsohn, 1974), Nolen-Hoeksema et al. argued that rumination fosters a sense of certainty that things are hopeless and that giving up is a less aversive option than managing uncertainty about whether situations can be controlled. Thus, it is theoretically plausible that rumination will not only reinforce depressed mood but will also reinforce passive and submissive interpersonal behaviour.

2.4.2 Interpersonal vulnerability to rumination

The following section summarizes converging interpersonal and cognitive theory which provides a theoretical rationale for the hypothesis that interpersonal factors confer vulnerability to rumination.

2.4.2.1 Excessive relationship concerns and fear of rejection confer vulnerability to rumination

Nolen-Hoeksema and Jackson (2001) argued that the tendency to take on undue responsibility for maintaining the emotional tone of relationships (unmitigated communion, Fritz & Helgeson, 1998; Helgeson, 1994) is a factor which contributes to rumination, because vigilance to one's own emotional states and feelings provides 'a barometer' of how relationships are going. Similarly, McBride and Bagby (2006) argued that the relationship focused interpersonal style (labelled 'interpersonal dependency'), which can be healthy and adaptive, becomes maladaptive when it leads to harmful rumination. McBride and Bagby (2006) argued that because they are often more 'interpersonally connected', women are especially vulnerable to interpersonal stressors and are therefore more likely to engage in harmful rumination when responding to interpersonal stress. Similarly, Saffrey and Ehrenberg (2007) hypothesised that anxiously

attached individuals, preoccupied both with maintaining relationships and preventing rejection, are predisposed to rumination due to experiencing heightened negative emotionality in response to partner behaviours and making negative self and relationship oriented attributions to explain interpersonal events. They proposed that individuals high in anxious attachment are likely to engage in rumination as a manifestation of ‘chronic mourning’ (Bowlby, 1980) in response to rejection and interpersonal loss.

The hypothesis that relationship concerns and fear of rejection fuels ruminative thinking is also consistent with a control theory account of rumination. In goal-discrepancy terms, rejection sensitivity renders the goals of maintaining relationships and avoiding abandonment especially salient and intrinsically linked to self definition (Ayduk & Gyurak, 2008), whilst at the same time increasing the likelihood of perceiving rejection (Downey & Feldman, 1996; Mor & Inbar, 2009). Thus individuals who are highly sensitive to rejection are more likely to perceive that the valued goals of avoiding rejection and maintaining relationships are not being met, generating the unresolved goal discrepancies that drive rumination (Martin & Tesser, 1996). Moreover, according to the control theory model, it will be particularly difficult for individuals to disengage from the goal of preventing rejection because this is an avoidance goal which cannot be satisfactorily resolved (Carver & Scheier, 1981), thus making it more likely that rejection sensitivity will generate ongoing cycles of ruminative thinking (i.e., unresolved goal related thoughts) than attainment related goals which have a more clearly demarcated end point.

2.4.2.2 Submissiveness, avoidance and chronic stress confer vulnerability to rumination

Nolen-Hoeksema et al. (1999, p.1062) argued that rumination is associated with

subordinate social status and diminished power. They proposed that the chronic strain associated with having a diminished ability to assert control over one's social environment is a trigger for ruminative thinking because individuals (often women) are 'searching for ways in which they can control their environment and their distress but do not feel efficacious about exerting that control and thus remain stuck in rumination'.

Consistent with the hypothesis that those who occupy a subordinate social status are more prone to rumination, Cheung et al. (2004, p. 1144) proposed that 'individuals who feel themselves to be low rank, with a tendency to behave submissively, may be more self-focused to ensure monitoring of expressed behaviour'. Thus, whilst it is theoretically plausible that rumination will fuel passive and submissive interpersonal behaviour (by reducing motivation, inhibiting problem solving and enhancing negative beliefs about low self-efficacy), it is also plausible that there is a reciprocal relationship between submissiveness/avoidance and rumination, because the underlying submissive and avoidant interpersonal style, and associated beliefs regarding low self-efficacy and control, are factors which could confer vulnerability to rumination.

The idea that submissiveness confers vulnerability to rumination is also consistent with the control theory account of rumination. Submissive individuals are likely to experience conflict between maintaining personal goals and the need to maintain relationships. Discussing the hypothesised relationship between the submissive tendency to silence one's own needs (self-silencing, Jack, 1999) and rumination, O'Mahen, Flynn, and Nolen-Hoeksema (in press, p.16) argued that 'Caught between their interpersonal and individual goals, rumination is a probable consequence in persons high in silencing.'

2.4.2.3 Rumination as a proximal mechanism linking interpersonal vulnerability factors to depression

Spasojević and Alloy (2001) argued that because individuals can be vulnerable to depression on the basis of various different underlying interpersonal and cognitive vulnerability factors, it is plausible that rumination might be a proximal mechanism which directly influences the development of depression. Thus, they conceptualised rumination as ‘a common cognitive result of the operation of many risk factors for depression’ (p.27). More specifically, they proposed that interpersonal style characterised by anxious concerns regarding rejection and interpersonal loss (neediness), self-criticism (characterised by feeling ambivalent about self and others and tending to assume blame and feel critical towards self) and negative cognitive styles all confer vulnerability to depression via their relationship with rumination.

The following section summarizes empirical evidence which substantiates the theorized links between rumination and interpersonal style which were outlined in the preceding section. The next section starts by describing evidence of a link between rumination, diminished relationship satisfaction, psychosocial impairment and interpersonal functioning, i.e., generalised psychosocial and interpersonal impairment (2.4.3). This is followed by a review of evidence which suggests a relationship between rumination and specific rumination-related interpersonal difficulties: a) excessive relationship concerns and fear of rejection (2.4.3.1.1); b) excessive reassurance-seeking (2.4.3.1.2); c) submissiveness and avoidance (2.4.3.1.3); d) stress generation (2.4.3.1.4).

2.4.3 Rumination and interpersonal functioning: Evidence of an association

Evidence of a general link between rumination and social functioning impairment

in depression includes findings from two cross-sectional studies. Lam, Schuck, Smith, Farmer, and Checkley (2003) compared ruminative and distracting coping styles in outpatients with unipolar depression ($N = 109$) and found that rumination was associated with increased, self-reported interpersonal distress whereas, conversely, distraction was associated with less interpersonal distress. Additionally, rumination was correlated with a range of interpersonal difficulties (difficulty being assertive, difficulty being submissive, difficulty being intimate, difficulty being sociable, too controlling and too responsible, as assessed on the IIP). Further, when the sample was split (median split) into 'ruminators' and 'non ruminators', Lam et al. (2003) found that a significantly higher proportion of ruminators reported poor functioning in interpersonal relationships (based on findings from a structured clinical interview, the MRC Social Performance Schedule).

In another cross-sectional study, Kuehner and Buerger (2005) compared remitted depressed ($n = 59$), partly remitted depressed ($n = 20$) and non remitted ($n = 10$) patients, to investigate determinants of subjective quality of life in depression and, more specifically, to investigate the effect of self-esteem, response style, and social support in relation to different domains of quality of life (measured using the WHOQOL-BREF, a self-report measure of life quality). Drawing on prior research findings which suggested that rumination and self esteem contribute to depressed mood and that rumination impairs interpersonal problem solving, they hypothesised that high rumination and poor self-esteem would predominately contribute to the psychological and social relations domains of quality of life. As predicted, Kuehner and Buerger (2005) found that rumination was significantly correlated with diminished relationship satisfaction and reduced psychological well being. Results from a hierarchical regression analysis indicated that

together rumination, distraction, self-esteem, and social support accounted for nearly one quarter (21%, $p < .05$) of the variance in relationship satisfaction.

2.4.3.1 Rumination, excessive relationship concerns and fear of rejection

Emerging empirical evidence is consistent with the hypothesis that rumination is associated with excessive relationship concerns and fear of rejection (McBride & Bagby, 2006; Nolen-Hoeksema & Jackson, 1999; Saffrey & Ehrenberg, 2007); First, in a large community sample, Nolen-Hoeksema and Jackson (2001) found that increased responsibility for the emotional tone of relationships and low perceived control over negative events was significantly correlated concurrently with rumination. Second, Saffrey and Ehrenberg (2007) found that rumination (brooding), but not reflection was significantly positively correlated with attachment anxiety, in a sample of students who had experienced a (partner initiated) relationship break-up in the past year, and that rumination mediated the relationship between attachment anxiety and negative adjustment to the relationship break-up (with all variables assessed at the same time point). Third, Downey and Feldman (1996) found that rejection sensitive individuals who were exposed to an ambiguous simulated rejection manipulation (being told that a confederate did not want to continue with the experiment in which they were participating) perceived more rejection and were more likely to ruminate about why the confederate had rejected them than low rejection sensitivity individuals, who were significantly less interested in understanding why the confederate did not return. Fourth, Gorski and Young (2002) found that sociotropy, defined as someone who ‘facilitates his or her goals through closeness in interpersonal relationships and is highly motivated to maintain relationships with others’ (p.465), was significantly positively correlated,

concurrently, with rumination, in an adolescent sample. Contrary to their predictions however, Gorski and Young (2002) also found that autonomy, with autonomous individuals defined as those who ‘reach their goals by distancing themselves from others’ (p.465) was positively associated with rumination. Fifth, in a longitudinal study which investigated the prospective relationship between interpersonal style and depression, rumination was significantly correlated with neediness, characterised by ‘anxious and helpless concerns regarding possible separation, rejection or interpersonal loss’ (p.27) and rumination mediated the effect of this maladaptive interpersonal style on future major depressive episodes, in a sample of students identified as being at high risk of depression (Spasojević & Alloy, 2001). In this study, rumination also mediated the effect of the self-critical interpersonal style, characterised by ‘feeling ambivalent about self and others and tending to assume blame and feel critical towards self’ (Blatt, D’Afflitti, & Quinlan, 1976) on prospective major depressive episodes.

Given the cross-sectional nature of the majority of the studies cited (with Spasojević & Alloy, 2001, the exception), the temporal and causal nature of relationship between rumination, excessive relationship concerns, and fear of rejection remains to be delineated. Moreover, the findings that the autonomous and self-critical interpersonal styles were correlated with rumination raises questions about whether rumination is associated specifically with an interpersonal style characterised by excessive relationship concerns and fear of rejection, as is implied by the theory discussed (McBride & Bagby, 2006; Nolen-Hoeksema & Jackson, 1999; Saffrey & Ehrenberg, 2007), or whether rumination is associated with maladaptive interpersonal styles more generally.

2.4.3.2 Rumination and excessive reassurance-seeking

To date, only one published study has investigated the relationship between rumination and excessive reassurance-seeking (Weinstock & Whisman, 2007). As hypothesised, Weinstock and Whisman (2007) found that rumination was correlated concurrently with excessive reassurance-seeking, and that rumination mediated the effect of excessive reassurance-seeking on depressive symptoms (all assessed at the same time point), in a non-clinical student sample.

Nolen-Hoeksema and Davis (1999) investigated the relationship between rumination and support seeking (a construct which overlaps conceptually with excessive reassurance-seeking) in a sample of recently bereaved individuals. In this longitudinal study, rumination was positively correlated with increased support seeking behaviour and higher levels of support seeking predicted increased depressive symptoms. Moreover, ruminators were less likely to report receiving social support, and were more likely to report interpersonal friction and isolation.

2.4.3.3 Rumination, submissiveness/subordination and avoidance

Preliminary findings are consistent with the hypothesised association between rumination, submissiveness, and avoidance. Thus, the tendency to perceive that one has low control over one's environment (labelled 'low mastery', a factor correlated with both subordinate social status and increased chronic strain) prospectively predicted increased rumination, assessed one year later in a large adult community sample (Nolen-Hoeksema, et al., 1999). Second, in a cross-sectional study (Cheung, et al., 2004, p.1145), submissive behaviour and shame, defined as negative beliefs about what one thinks others think about the self, were both significantly positively correlated with rumination (although,

contrary to prediction, social comparison, defined as ‘feeling inferior’, was not correlated with rumination). Third, rumination was correlated with measures of behavioural avoidance, controlling for anxiety, in a student sample (Moulds, Kandris, Starr, & Wong, 2007). Fourth, in a sample of pregnant women, rumination was correlated with a submissive tendency to silence one’s own needs (silencing the self, Jack, 1999, O’Mahen et al., in press)

2.4.3.4 Rumination and interpersonal stress in depression

To date, only one published study has investigated the prospective relationship between rumination and chronic interpersonal stress. Nolen-Hoeksema et al., (1999) found a bi-directional relationship between rumination and chronic strain, whereby, rumination prospectively predicted increased chronic strain, and chronic strain predicted increased rumination, one year later in a community adult sample. In addition, a range of rumination related cognitive-behavioural factors have been investigated as mechanisms of stress generation including interpersonal problem solving (Davila, et al., 1995), negative cognitive styles (Safford, Alloy, Abramson, & Crossfield, 2007), and avoidance coping, defined as ‘cognitive and behavioural efforts oriented toward denying, minimizing or otherwise avoiding dealing directly with stressful demands’ (Holahan et al., 2005, p.659). However, there is currently a lack of empirical evidence which indicates that rumination predicts increased dependent interpersonal event stress, assessed using a contextual threat method, which is necessary to test the stress generation hypothesis.

2.4.4 Summary: Interpersonal context of rumination

To summarize, there is a body of converging cognitive and interpersonal theory,

supported by substantive empirical evidence, which underpins the overarching thesis hypothesis that rumination, maladaptive interpersonal styles, and poor psychosocial adjustment are interrelated. More specifically, the Response Styles Theory of rumination (Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema et al., 1999) and interpersonal models of depression (Saffrey & Ehrenberg, 2007; McBride & Bagby, 2006) provide a rationale for hypothesizing that rumination is associated with an interpersonal style (and corresponding interpersonal behaviours) characterised by excessive relationship concerns and submissiveness.

Findings from a range of empirical studies are broadly consistent with the hypothesis that rumination is associated with this specific interpersonal style. However, the majority of the studies cited have not included a comprehensive range of interpersonal measures. Since different aspects of interpersonal functioning are often correlated, studies that have only used one or two measures may have spuriously concluded that a particular variable is directly associated with rumination, when, in fact, a common third variable such as another aspect of interpersonal functioning, may explain the relationship. The examination of a more extensive range of interpersonal measures would limit this potential difficulty in interpretation.

In previous studies which have either a) not statistically controlled for depression (e.g., Gorski & Young, 2002; Nolen-Hoeksema et al., 1999) or b) used the whole rumination scale (contaminated with items assessing depressive symptoms, Treynor et al., 2003, e.g., Nolen-Hoeksema & Jackson, 2001) depression might be another common third variable which explains the relationship between rumination and interpersonal style. Including depressive symptoms as a control variable in statistical analyses assessing the

relationship between rumination and aspects of interpersonal functioning is necessary to rule out the possibility that previous findings are simply due to common associations with depression. Moreover, replicating statistical analyses using the brooding sub-component, which does not include items contaminated with depressive symptoms, provides another method for evaluating whether shared variance with depression accounts for the relationship between rumination and interpersonal functioning.

The theoretical models conceptualised by Joiner (2000), Lyubomirsky and Tkach (2004), and Tse and Bond (2004) make specific predictions about the ways in which rumination might fuel maladaptive interpersonal behaviour and generate interpersonal stress (e.g., through negatively biasing thinking and occupying cognitive resource necessary for effective interpersonal functioning). Conversely, converging theories about what motivates individuals to ruminate (Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema et al., 1999) and how interpersonal vulnerability factors contribute to depression (Saffrey & Ehrenberg, 2007; McBride & Bagby, 2006; Spasojević & Alloy, 2002) have jointly led to a consideration of whether underlying interpersonal vulnerability factors may generate rumination.

However, there is currently a lack of longitudinal research which has systematically investigated the temporal direction of relationship between rumination and interpersonal mechanisms. This limits drawing conclusions about the temporal and causal nature of relationship between rumination and interpersonal functioning. Moreover, in order to demonstrate causality necessitates the experimental manipulation of rumination and/or interpersonal style, in order to test the causal direction of the relationship between rumination and interpersonal difficulty (i.e., does rumination cause interpersonal

difficulties? Do interpersonal issues cause rumination? Or is it a bidirectional relationship?).

Moreover, of the limited longitudinal findings that are available, it is not clear to what extent these findings can be generalised to a clinical population where they were drawn from a student sample (e.g., Spasojević & Alloy, 2002) or from general community samples (e.g., Nolen-Hoeksema et al., 1999). Further research incorporating longitudinal design and/or manipulation of rumination/interpersonal factors, and using clinically depressed individuals, is necessary to increase understanding of the temporal and causal nature of relationship between rumination and interpersonal functioning.

From this starting point, the thesis sets out to address the following key research questions. First, is rumination associated with all forms of poor interpersonal functioning or with specific interpersonal styles? Second, is the relationship between rumination and depressogenic interpersonal styles and psychosocial adjustment maintained after controlling for shared variance with depressive symptoms? Third, what is the temporal and causal nature of relationship between rumination and interpersonal style?

In an endeavor to address the limitations identified with the current literature, the thesis aims to extend understanding of the relationship between rumination and depressogenic interpersonal factors by: a) conceptualizing social adjustment and interpersonal styles as complex multi-dimensional constructs; b) incorporating a prospective design and manipulation of rumination (via clinical intervention) to test the causal relationship between rumination and interpersonal functioning; c) using clinically depressed and remitted depressed participants to increase the generalizability and clinical relevance of the findings and to enable differentiation between state and trait factors; d)

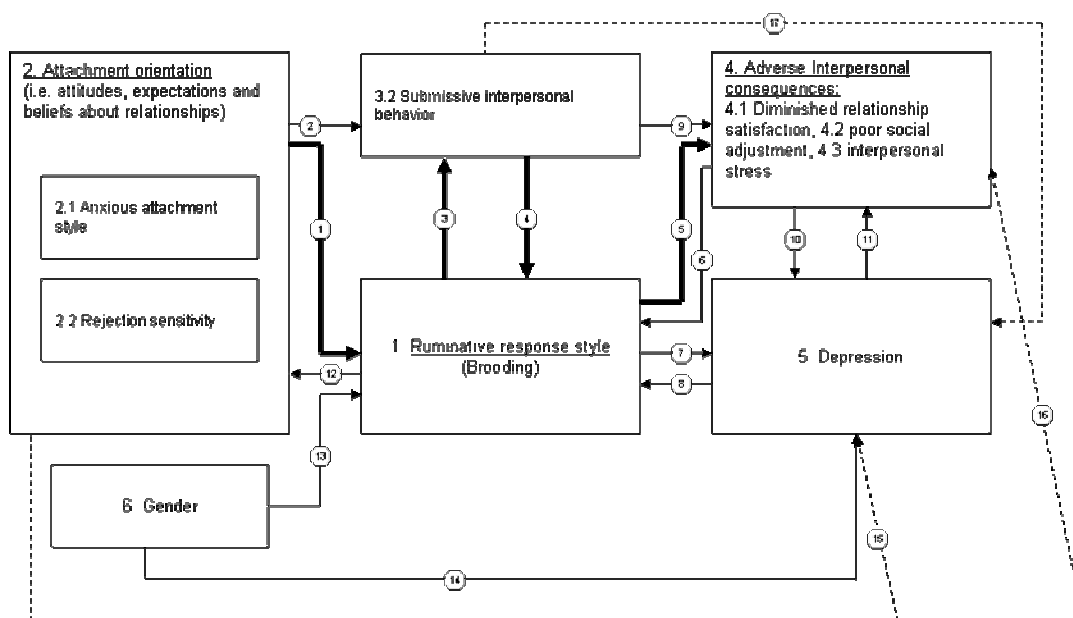
use of interviewer-rated measures of depression and a contextual threat assessment of life events to reduce the reliance on self-report measurement of depression and life stress.

2.5 Hypothesised thesis model

The proposed thesis model (Figure 2.1) attempts to organize the diverse findings that are relevant to understanding the interpersonal context of rumination into a single conceptual framework.

Figure 2.1:

Hypothesised Thesis Model



Bold lines (1, 3, 4 and 5) denote primary thesis hypotheses. Dashed lines indicate that the direct relationship is predicted to be mediated by another variable.

The following key hypotheses, which underpinned the thesis research, were the elements that made up this preliminary model.

2.6 Thesis hypotheses

Hypothesis 1. Rumination is associated with a specific attachment orientation and sub-set of maladaptive interpersonal behaviours

The literature review suggests that rumination is associated with a specific attachment orientation and a sub-set of maladaptive interpersonal behaviours, and that this relationship is not solely due to shared associations with depression. First, the theories discussed suggest that an attachment orientation incorporating fear of rejection is associated with rumination, because individuals who anxiously expect and fear rejection will ruminate in order to monitor how their relationships are going (Nolen-Hoeksema & Jackson, 1999), and in response to rejection events (Saffrey & Ehrenberg, 2007). Second, rumination has been conceptualised as a form of avoidance, which inhibits motivation and initiative and reinforces the perception that one cannot assert control over one's external environment (Nolen-Hoeksema, et al., 1999). Thus, there is a theoretical rationale, supported by emerging empirical evidence (Cheung, et al., 2004; Moulds, et al., 2007; Nolen-Hoeksema, et al., 1999; O'Mahen, et al., in press), which indicates that rumination is associated with passive and submissive interpersonal behaviours.

Drawing on this converging theory and evidence, the first thesis hypothesis was that rumination is specifically associated with an attachment orientation characterised by fear of rejection and an interpersonal style characterised by submissive interpersonal behaviours. The 'rejection sensitive' attachment orientation was operationalized using measures of rejection sensitivity, ARSQ, Downey & Feldman, 1996, and anxious attachment style (ECR-R, Fraley et al., 2000). The submissive interpersonal style was

operationalized, following principal components analysis of interpersonal behaviour variables, as an interpersonal component with highest loadings on the overly-accommodating, non-assertive and self-sacrificing sub-scales of the IIP-64, Alden, et al., 1990, see section 4.5.2). If rumination is specifically associated with rejection sensitivity and the submissive interpersonal style (i.e., rather than being associated with insecure attachment style and maladaptive interpersonal behaviours more generally) then the concurrent relationship between these variables should be retained after statistically controlling for shared variance with depressive symptoms, avoidant attachment style and other maladaptive interpersonal behaviours (cold and needy interpersonal behaviours. This hypothesis is tested in chapter 4 of the thesis (study 2).

Hypothesis 2. Rumination causes adverse interpersonal consequences

As summarised in the literature review, recent theorizing about the interpersonal context of rumination (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004) and emerging empirical findings from cross-sectional studies (Lam, et al, 2003; Kuehner & Buerger, 2005) suggests that ruminative thinking may adversely affect interpersonal relationships and social adjustment. The first step to testing this hypothesis is to examine the temporal (longitudinal) relationship between rumination and key interpersonal outcomes: if rumination does adversely affect interpersonal consequences, then it should prospectively predict worse interpersonal outcomes (Chapter 3, study 1 and Chapter 7, study 5).

Thus, the second thesis hypothesis was that rumination prospectively predicts adverse interpersonal outcomes. Interpersonal outcomes included in the thesis included diminished relationship satisfaction (operationalized using the WHOQOL-Bref, social

relationships sub-scale, Harper & Power, 1998; Orley, Harper, Power, & Billington, 1997) and social adjustment (operationalized using the SAS-SR, Weissman, 1999, a more comprehensive measure encapsulating performance, interpersonal behaviour, conflict and feelings and satisfaction across the domains of work, social life, familial and partner relationships). Moreover, based on previous findings (Davila, et al., 1995; Holahan, et al., 2005; Safford, et al., 2007), which have implicated a number of rumination-related cognitive mechanisms as being mechanisms of stress generation, and in conjunction with the theoretical models discussed, it was further predicted that rumination is a cognitive mechanism fuelling interpersonal stress in depression.

The association of rumination with poor social adjustment is not sufficient to demonstrate that rumination plays a causal role in the development of social adjustment difficulties. To demonstrate causality it is necessary to manipulate rumination, whilst controlling for other factors, in order to test whether differences in social functioning (the dependent variable), can be attributed to change in rumination (the independent variable). For the purposes of testing the causal nature of relationship between rumination and poor social adjustment, a novel methodological approach was employed in which rumination was manipulated via an applied intervention (concreteness training compared to a treatment-as-usual control condition, and a relaxation active control condition), within the context of a randomized controlled trial. This experimental intervention approach provided a test of proof-of-principle of whether reducing rumination improves social adjustment (Chapter 8, study 6).

Hypothesis 3. Rumination fuels specific maladaptive interpersonal behaviours

Joiner's (2001) self-propagatory model assumes that rumination is a key cognitive

mechanism which fuels depressogenic maladaptive interpersonal behaviours. Because rumination is causally implicated in increased negative thinking and impaired interpersonal problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999), and reduced motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993), it is hypothesised that rumination would generate submissive/passive interpersonal behaviours. Further, because rumination negatively biases how individuals perceive their relationships and interpersonal problems (Lyubomirsky, et al., 1999; Nolen-Hoeksema & Davis, 1999), it is hypothesised that rumination will activate underlying fears of rejection and abandonment. The fourth thesis hypothesis was that rumination would prospectively predict: a) increased submissive interpersonal behaviours; b) increased levels of rejection sensitivity (Chapter 6, study 4).

The association of rumination with maladaptive interpersonal behaviours is not sufficient to demonstrate that rumination plays a causal role in the development of maladaptive interpersonal behaviours. To demonstrate causality, it is necessary to manipulate rumination whilst controlling for other factors, in order to test whether differences in maladaptive interpersonal behaviours can be attributed to change in rumination. Thus, in order to test the causal nature of relationship between rumination and submissive interpersonal behaviours, it is necessary to manipulate rumination and assess subsequent levels of maladaptive interpersonal behaviour. It was hypothesised that reducing rumination would cause a decrease in submissive interpersonal behaviours (Chapter 8, study 6). Note: the thesis did not investigate the alternative direction of relationship, i.e., testing whether changes in rumination are attributable to changes in interpersonal behaviour. However, this alternative causal hypothesis is also predicted by

the proposed model.

Hypothesis 4. Interpersonal factors predict rumination

Theorizing about the interpersonal context of rumination suggests that interpersonal factors confer vulnerability to rumination. First, Nolen-Hoeksema and Jackson (2001) proposed and found that people who are excessively concerned with maintaining close relationships (i.e., sensitive to rejection) will be susceptible to rumination in order to monitor how their relationships are going. Similarly, Saffrey and Ehrenberg (2007) argued that individuals who are preoccupied by fears of rejection and abandonment would have more difficulty adjusting following the end of a relationship, thereby leading to increased rumination about the interpersonal loss. Second, submissiveness might lead to rumination by diminishing problem solving abilities, decreasing social competence and thereby contributing to the maintenance of unresolved interpersonal goals, driving further rumination.

It was therefore predicted that: a) rejection sensitivity would prospectively predict increased rumination six months later; b) submissive interpersonal behaviours would prospectively predict increased rumination six months later.

2.7 Secondary thesis hypotheses

Hypothesis 5. Rumination and interpersonal factors predict depression

A key prediction of the RST (Nolen-Hoeksema, 1991), supported by findings from longitudinal studies (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Spasojević & Alloy, 2001), is that rumination prospectively predicts depression. It was therefore hypothesised that rumination would prospectively predict increased depressive

symptoms. Similarly, interpersonal theories of depression assume that underlying fears of rejection (Carnelley, Pietromonaco, & Jaffe, 1994; Downey & Feldman, 1996), submissiveness (Gilbert, et al., 1995), and neediness/excessive reassurance-seeking (Coyne, 1976; Zuroff, et al., 2004), are key interpersonal risk factors for depression. Given the centrality of passivity/submissiveness and avoidance in theoretical accounts of depression, it was predicted that submissive interpersonal style will be the primary interpersonal predictor of depression, when controlling for other interpersonal styles. Moreover, consistent with previous theorising, which conceptualised rumination as a proximal mechanism linking underlying interpersonal vulnerability factors to depression (Spasojević & Alloy, 2001), it was further predicted that the relationship between the submissive interpersonal style and prospective depression is dependent on shared variance with rumination.

Hypothesis 6. Brooding is the most maladaptive component of rumination

Recent psychometric analyses have distinguished different components of the overall rumination construct, delineating a maladaptive factor labelled brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’ which predicted depressive symptoms and a more adaptive reflection factor, defined as a ‘purposeful turning inward to engage in cognitive problem solving to alleviate one’s depressive symptoms’ (Treyner, et al., 2003, p.256), which did not predict prospective depression. Drawing on these previous findings it was anticipated that the predicted pattern of results (Hypothesis 1 – Hypothesis 4) would be obtained for the overall rumination scale and the brooding sub-scale but not the less harmful reflection sub-scales.

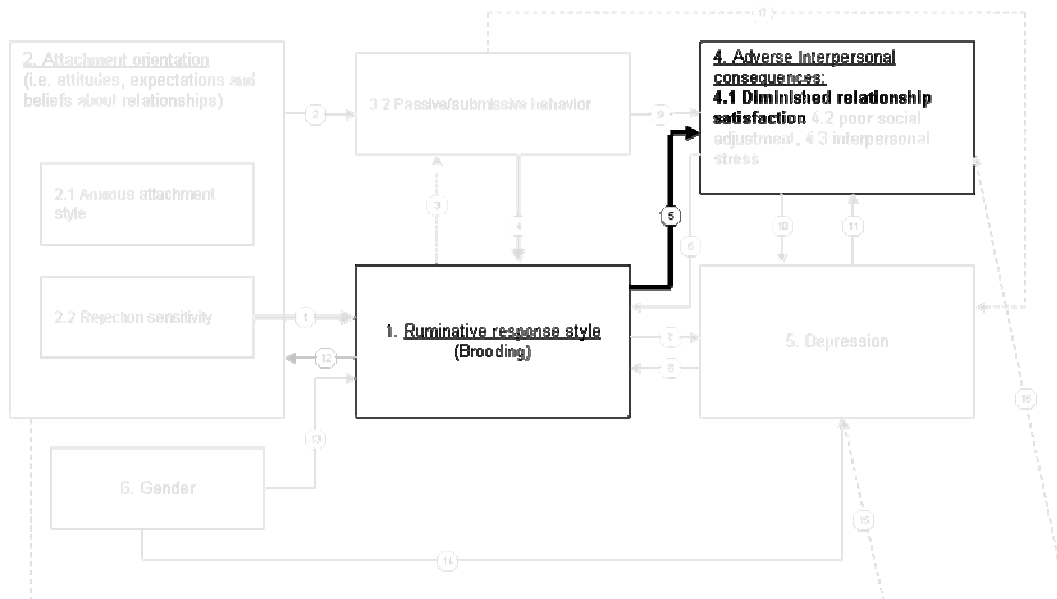
CHAPTER 3: Interpersonal consequences of rumination: A preliminary test

3.1 Preface

The primary aim of the first thesis study (study 1) was to provide a preliminary test of the hypothesis that rumination (brooding, not reflection) is a temporal antecedent of adverse interpersonal consequences (path 5 as specified in the hypothesised thesis model, Figure 3.1). This represented a necessary first step towards testing whether rumination is causally implicated in poor interpersonal functioning in depression. If rumination causes poor interpersonal functioning then it should also prospectively predict poor interpersonal functioning. Thus, demonstrating that rumination is a temporal antecedent of diminished relationship satisfaction provides a necessary, but not sufficient, first step towards demonstrating causality (establishing causality would necessitate demonstration that manipulating rumination influences social functioning). Failure to observe the expected predictive relationship would argue against rumination playing a causal role, whilst observing a predictive relationship would suggest the value of further testing. Study 1 replicated analyses undertaken in a previous study which assessed the concurrent relationship between rumination and relationship satisfaction (Kuehner & Bueger, 2005). The results of the current study were written up as a brief report, which has been published (on-line), in the *British Journal of Clinical Psychology* (Pearson, Watkins, Kuyken, & Mullen, 2010).

Figure 3.1:

Hypothesised Thesis Model: Study 1, Hypothesis 2



The study used an opportunity sample of data collected from adults with a history of past (recurrent) major depression, recruited and assigned to the treatment as usual (TAU) arm of a randomized controlled trial of Mindfulness-based Cognitive Therapy (MBCT, Kuyken, et al., 2008). Hierarchical regression analyses were conducted using one data point collected at a baseline assessment and a further data point collected at a three month follow-up assessment. Chapter 2 includes an exact copy of the paper as published. In this preface section, some further detail about the study procedure is provided, this was not included in the main paper in order to enable adherence to the journal's word limit.

In this study, the WHOQOL-BREF social sub-scale was employed (Kuyken & Orley, 1994; Kuyken, et al., 1995). For the purposes of the current study, only the social sub-scale was analysed (although the measure includes other scales assessing

psychological functioning, physical health, and environmental factors). The social sub-scale comprises three items assessing relationship satisfaction related to personal relationships and sex life and support from friends (1) how satisfied are you with your personal relationships?; (2) how satisfied are you with your sex life?; (3) how satisfied are you with the support that you get from your friends?). Participants are asked to rate their level of satisfaction on a five point scale (1, very dissatisfied, 2, dissatisfied, 3, neither satisfied or dissatisfied, 4, satisfied, 5, very satisfied).

The Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960; Williams, 1988) was used in this study to assess depressive symptom severity. The HRSD is an interviewer administered measure of depressive symptoms with an emphasis on somatic symptoms. Higher scores represent greater depression severity (range 0-52). Responses to questions were rated according to the system recommended by Williams (2001) in which the intensity and frequency of depressive symptoms are evaluated separately, to arrive at an overall severity score for each item. The trial included the brooding sub-scale from the Ruminative Responses Scale (Nolen-Hoeksema, 1991; Treynor, et al. 2003), but did not include the whole rumination scale or the reflection sub-scale.

Participants for the trial were recruited from GP practices across Devon. Thus, the sample is representative of presentations of recurrent depression as seen in primary care. Inclusion criteria were: (a) three or more previous episodes of depression meeting DSM-IV criteria (including the most recent episode); (b) aged 18 or older; (c) on a therapeutic dose of anti-depressant medication (in line with the British National Formulary and the NICE depression guidelines) for at least six months; (d) either in full or partial remission from the most recent episode of depression (partial remission was defined either as

having experienced the last full episode of depression within the last two months or reporting 3-4 DSM-IV symptoms of major depression at the time of intake, American Psychiatric Association, 1994). Exclusion criteria were: (a) co-morbid diagnoses of current substance dependence; (b) organic brain damage; and (c) current past psychosis, bipolar disorder; (d) persistent anti-social behaviour; (e) persistent self-injury requiring clinical management/therapy; (f) being unable to engage with MBCT for physical, practical or other reasons (e.g., very disabling physical or mental health problem, unable to comprehend materials); (g) formal concurrent psychotherapy.

Data was entered on an SPSS database by two research officers. The study data set comprised a sub-set of the main dataset, which included the raw data and calculated scale scores (computed using SPSS syntax files). Raw scores on the WHOQOL measure were transformed using the algorithm provided in the WHOQOL manual, which converts domain scores to a 0-100 scale. Data cleaning followed the protocol set out by Tabachnick & Fidell (2007; pp. 56-108). Initially, this involved examining descriptive statistics and graphic representations of all key variables to assess whether variables were within range and to consider the plausibility of means and standard deviations and to assess whether the correlations between variables was in the expected direction. A random sampling (10%) of data files was checked to ensure integrity in the data entry process. This involved independently entering a sub-set of participant files and then comparing the descriptive statistics for the two subsets of data. The error rate was very low (0.04%).

In some cases, participants did not complete scales in full. If <10% of the data for a scale was missing at a given time point then a “prior knowledge” imputation method

was applied (Tabachnick & Fidell, 2007). For scales where a clear construct with multiple items with a high degree of internal inconsistency make up the scale, non-missing items are used to infer the score of the missing value (the scale total divided by the number of completed items is imputed for the missing item(s) at that time point).

Pearson, K.A., Watkins, E.R., Kuyken, W. & Mullen, E.G. (2010). The psychosocial context of depressive rumination: Ruminative brooding predicts diminished relationship satisfaction in individuals with a history of past major depression.

British Journal of Clinical Psychology.

3.2 Abstract

Objective. To test the hypothesis that rumination contributes to poor social functioning by examining whether ruminative brooding predicts subsequent relationship satisfaction in individuals with a history of major depression.

Method. Participants ($N = 57$) were interviewed to assess depressive symptoms and completed self-report measures of brooding and relationship satisfaction, at intake into the study (Time 1) and three months later (Time 2).

Results. Brooding was related concurrently to relationship satisfaction at Time 2 ($p < .01$; approaching significance at Time 1, $p = .06$). Baseline brooding predicted diminished relationship satisfaction three months later, controlling for baseline relationship satisfaction ($p < .05$).

Conclusions. Brooding may be an early warning sign for increasing relationship difficulties in those vulnerable to depression.

3.3 Introduction

Depressive rumination, defined as repetitively focusing on the symptoms of depression and their causes and meanings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), has been implicated in the onset and maintenance of depression, in both experimental and prospective longitudinal studies (for reviews see Nolen-Hoeksema, et al., 2008; Watkins 2008). Treynor, Gonzalez, and Nolen-Hoeksema (2003) distinguished between maladaptive brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’ (p.256), which prospectively predicted increase in depressive symptoms, and a more adaptive reflection factor, which did not.

Similarly, there is an extensive literature which indicates that interpersonal factors can confer vulnerability to depression. Psychosocial factors implicated in the aetiology of depression include diminished relationship satisfaction (Beach & O’Leary, 1993), stable features of interpersonal style, such as insecure attachment patterns (Bifulco, et al., 2006), and specific maladaptive interpersonal behaviours, such as excessive reassurance-seeking, (Joiner & Metalsky, 2001).

Recognising that these two processes that both confer vulnerability for depression may not be independent, Joiner (2000) hypothesised that rumination might be a ‘cognitive motor’ driving interpersonal difficulties in depression. Consistent with Joiner’s (2000) hypothesis, rumination has been correlated with impairments in social functioning and diminished relationship satisfaction. For example, in the recently bereaved, rumination was associated with excessive support seeking, increased friction, social isolation and lower perceived social support (Nolen-Hoeksema & Davis, 1999). Similarly, rumination was associated with increased interpersonal distress and

psychosocial difficulties in a sample of depressed individuals (Lam, Schuck, Smith, Farmer, & Checkley, 2003). In currently depressed and formerly depressed individuals, Kuehner and Bueger (2005) found that rumination was correlated with reduced relationship satisfaction.

One limitation of the latter two studies was their cross-sectional design, such that the direction of the causal relationship between interpersonal distress, diminished relationship satisfaction and rumination could not be determined. A preliminary, if not definitive, step towards determining causality is to examine the longitudinal relationship between rumination and relationship satisfaction.

Therefore, the aim of the current study was to replicate Kuehner and Bueger's (2005) cross-sectional findings and to test whether rumination prospectively predicts diminished relationship satisfaction. Because brooding has been identified as the most pathological subtype (Treyner et al. 2003), we predicted that ruminative brooding would be significantly negatively correlated with (a) concurrent relationship satisfaction at both time points; (b) future relationship satisfaction, controlling for baseline relationship satisfaction.

3.3 Method

3.3.1 Participants

The sample was 57 formerly depressed individuals (age, $M = 49.23$, $SD = 11.71$, range 21-72; 80.7% women, mean number of past Major Depressive Episodes = 6.43) recruited into a controlled trial of Mindfulness-Based CBT to prevent relapse into depression, and randomized to the maintenance antidepressant treatment arm. (For full details of inclusion and exclusion criteria see Kuyken, et al., 2008).

3.3.2 Procedure

A prospective longitudinal design was used with participants assessed at initial baseline (Time 1) and three months later (Time 2). (For full details of the trial procedure see Kuyken, et al., 2008).

3.3.3 Measures

Diagnostic Status. The Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 1997) was used to determine diagnostic status at baseline. A high level of inter-rater reliability was reported (kappa coefficient = 0.84).

Depression severity. The Hamilton Rating Scale for Depression, HAM-D, 17 item version (Hamilton, 1960; Williams, 1988), an interviewer administered measure, was used to assess depressive symptoms at each time point (Time 1: $M = 5.98$, $SD = 4.75$; Time 2: $M = 7.12$, $SD = 5.83$).

Relationship satisfaction. The World Health Organisation-BREF social relationships subscale was used to assess relationship satisfaction at each time point (Time 1: $M = 52.78$, $SD = 22.24$; Time 2: $M = 50.88$, $SD = 22.70$). (Harper & Power, 1998; Orley, Harper, Power, & Billington, 1997). The social domain assesses relationship satisfaction related to personal relationships, sex life, and support from friends (range 3-15). The sub-scale had good internal consistency (Time 1: $\alpha = .71$; Time 2: $\alpha = .70$).

Rumination. Ruminative brooding was measured using the five items which make up the Brooding subscale from the 22 item Ruminative Responses Scale measure of depressive rumination (Treyner, et al., 2003, Time 1: $M = 13.51$, $SD = 2.99$; Time 2: $M = 13.49$, $SD = 4.00$). The scale has high face and content validity and had good internal consistency (Brooding: Time 1: $\alpha = .67$; Time 2: $\alpha = .84$).

3.4 Data Analysis

The regression models were built on conceptual (Kuehner & Buerger, 2005) and statistical grounds: only independent variables statistically significantly correlated with relationship satisfaction (dependent variable) were entered into the regression.

3.5 Results

3.5.1 Concurrent relationship between variables

At Time 1, the concurrent association between brooding and relationship satisfaction was approaching significance ($r = -.25, p = .06, N = 57$). The relationship between Time 1 relationship satisfaction and Time 1 depressive symptoms was not significant ($r = -.23, p = .09, N = 57$). Time 2 relationship satisfaction was significantly negatively correlated with concurrent Time 2 brooding ($r = -.54, p < .01, N = 57$) and depression ($r = -.50, p < .01, N = 57$). A multiple regression analysis tested the hypothesis that brooding would explain variance in relationship satisfaction concurrently at Time 2, after controlling for Time 2 depressive symptoms (Table 3.1a). Time 2 brooding accounted for 20.1% unique variance in relationship satisfaction ($t = -4.43, p < .01, f^2 = .36$), after controlling for Time 2 depressive symptoms

Table 3.1

Summary of Hierarchical Regression Analyses: (a) Cross-sectional: Time 2 Brooding and Time 2 Depressive Symptoms Explain Variance in Time 2 Relationship Satisfaction, (b) Prospective: Time 1 Relationship Satisfaction and Brooding Predict Time 2 Relationship Satisfaction (Three Months Later).

a)				b)			
Variable	B	SE B	Beta	Variable	B	SE B	Beta
Step 1				Step 1			
T2 depressive symptoms	-1.93	.46	-.50***	T1 relationship satisfaction	.78	.09	.76***
Step 2				Step 2			
T2 depressive symptoms	-1.56	.40	-.40***	T1 relationship satisfaction	.73	.09	.71***
T2 brooding	-2.60	.59	-.46***	T1 brooding	-1.38	.67	-.18*

Note. DV = T2 relationship satisfaction
 $R^2 = .25$ for step 1 ($p < .001$, $f^2 = .33$), $\Delta R^2 = .20$ ($p < .001$, $f^2 = .36$) for step 2

Note. DV = T2 relationship satisfaction
 $R^2 = .58$ for step 1 ($p < .001$, $f^2 = 1.36$), $\Delta R^2 = .03$ ($p < .05$, $f^2 = .08$) for step 2

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

3.5.2 Prospective relationship between variables

Time 1 brooding was significantly correlated with Time 2 relationship satisfaction ($r = -.36$, $p < .01$). A multiple regression analysis tested the hypothesis that Time 1 brooding would prospectively predict Time 2 relationship satisfaction (Table 3.1b). Time 1 relationship satisfaction predicted Time 2 relationship satisfaction, explaining 57.7% variance. In addition, Time 1 brooding was a statistically significant predictor of Time 2 relationship satisfaction, controlling for Time 1 relationship satisfaction, accounting for 3.1% unique variance ($t = -2.07$, $p < .05$, $f^2 = .08$).

A secondary multiple regression entered Time 1 relationship satisfaction at Step

1, Time 1 depression severity at Step 2 and Time 1 brooding at Step 3. Time 1 depression severity did not predict any significant incremental variance in Time 2 relationship satisfaction ($t = -1.20, p = .24$), suggesting that it is a redundant variable. Allowing for Time 1 relationship satisfaction and Time 1 depression severity, Time 2 brooding explained an additional 2.3% variance in Time 2 relationship satisfaction, which was approaching statistical significance ($p = .08$).

3.6 Discussion

As predicted, brooding accounted for unique variance in concurrent relationship satisfaction at Time 2, and approached significance at Time 1. Critically, these findings extend Kuehner and Bueger's (2005) results to a prospective longitudinal design. Moreover, consistent with Joiner's (2000) hypothesis, brooding predicted diminished perceived relationship satisfaction three months later even after statistically controlling for baseline relationship satisfaction (57.7% variance).

The difference in the concurrent relationship by time point possibly reflects differences in the sample across the course of the study. At intake, the sample was homogeneous, in that all participants were partially or fully remitted from a major depressive episode. Three months later, nearly one quarter ($N = 14$) had relapsed into a major depression, more consistent with the sample in Kuehner and Bueger's (2005) study (11%, $N = 10$ currently depressed individuals). The greater variance of depressive symptoms and rumination between individuals at Time 2 potentially increased the probability of finding a relationship between these variables. Further, brooding may be more maladaptive in the context of increasing depression (Nolen-Hoeksema, 1991).

Several mechanisms have been hypothesised for how brooding may reduce

relationship satisfaction (Tse & Bond, 2004). First, ruminative brooding may exacerbate a negative cognitive bias, increasing attention to and recall of negative aspects of social interactions, increasing perceived dissatisfaction and exacerbating reassurance-seeking. Second, brooding may have a direct adverse effect on relationship quality by occupying limited cognitive resources which could otherwise be used for processing incoming social cues, social perception and interpersonal problem solving (Nolen-Hoeksema, 1991).

Some limitations to the study are noteworthy. First, the sample was relatively small. Second, the sample was limited to formerly depressed individuals, raising questions about whether the results would generalize to currently depressed patients. Future research would usefully recruit a larger sample of participants, including currently depressed individuals. Third, the research only assessed a broad index of relationship satisfaction. Assessment of specific interpersonal difficulties and behaviours, preferably including direct observation, would offer a more detailed understanding of the relationship between rumination and diminished relationship satisfaction. Moreover, although the study extended Kuehner and Buehner's (2005) results by incorporating a prospective design, the direction of causality between rumination and relationship satisfaction is not proven. To confirm that rumination is a causal mechanism underlying relationship dissatisfaction in depression, rumination must be bi-directionally manipulated, i.e., through an experimental induction or treatment.

In conclusion, the findings provide further evidence consistent with the hypothesis that rumination is associated with interpersonal difficulties in depression. The findings have potential clinical implications. First, brooding may be an early warning sign of relationship difficulties. Second, treatments which reduce brooding may help the

interpersonal relationships of those vulnerable to depression.

CHAPTER 4: Psychosocial correlates of depressive rumination

4.1 Preface

The primary aim of chapter 4 is to test the hypothesis that rumination (specifically the maladaptive brooding subcomponent) is associated with an attachment orientation characterised by fear of rejection, and a submissive interpersonal style encapsulating overly-accommodating, non-assertive and self-sacrificing interpersonal behaviours. The study reported in this chapter (study 2) builds on theory and emerging empirical findings which indicate that rumination is significantly correlated with anxious concerns about maintaining relationships and avoiding rejection (McBride & Bagby, 2006; Nolen-Hoeksema, & Jackson, 1999; Saffrey & Ehrenberg, 2007, see section 2.4.3.1), and submissiveness (Cheung, Gilbert, & Irons, 2004; Nolen-Hoeksema, Larson, & Grayson, 1999, see section 2.4.3.3).

To date, previous studies have not assessed the relationship between rumination, rejection sensitivity and the maladaptive submissive interpersonal style whilst systematically controlling for shared variance with depressive symptoms and the influence of other insecure attachment patterns and/or interpersonal styles. Thus, this research study represents a necessary next step before proceeding to establish direction of causality. Before dedicating time and resources to establish whether rumination causes poor interpersonal functioning (or, vice versa, if interpersonal factors confer vulnerability to rumination), it was deemed to be good clinical research practice to first establish: (a) that these constructs are actually correlated in the real world, that is, that understanding their relationship may be ecologically meaningful; (b) that this relationship is not simply

the result of their association with common factors such as depression; (c) to discriminate which specific elements of the constructs (e.g., which aspects of underlying attachment style and interpersonal behaviours) are associated with rumination.

The research was undertaken in collaboration with a primary care service for depression, the North Devon AccePT team, with NHS ethics approval (07/Q2102/30). A copy of the study research protocol and participant information sheet is included in main appendices section (Appendix 3). Nearly one quarter of the study participants were recruited from this service, with the rest recruited from the wider community (across North and Mid Devon). The principal investigator was solely responsible for participant recruitment and for data collection, which took place between April 2007 and June 2008 (it is estimated that approximately 150-200 hours were expended by the principal investigator recruiting participants for sample 2). Posters were distributed, by the principal investigator, across a range of locations including shops, leisure centres, schools and offices across the Devon area. The Principal Investigator also contacted (by telephone) individuals on the Mood Disorders Centre database. In total, nearly 200 individuals were contacted to obtain the final sample of 103 participants. The aim in recruiting this mixed sample was to ensure heterogeneity in depressive symptoms, rumination, and interpersonal difficulties so that there was adequate variance necessary to be able to detect relationships between these variables. The principal investigator was solely responsible for recruitment and all data collection, minimizing the potential for any possible researcher effects.

Data was entered on an SPSS database by the principal investigator, with the assistance of three interns. The dataset included the raw data and calculated scale scores

(computed using SPSS syntax files). Data cleaning followed the protocol set out by Tabachnick and Fidell (2007; pp. 56-108). Initially this involved examining descriptive statistics and graphic representations of all key study variables to assess whether these were within range, to consider the plausibility of means and standard deviations, and to assess whether the correlations between variables was in the expected direction. A random sampling (nine cases) of data files was checked to ensure integrity in the data entry process. This involved independently entering a sub-set of participant files and then comparing the descriptive statistics for the two subsets to identify anomalies in the data. The error rate was acceptably low (2.5%). In some cases, participants did not complete scales in full. If <10% of the data for a scale was missing at a given time point then a “prior knowledge” imputation method was applied (Tabachnick & Fidell, 2007). For scales where a clear construct with multiple items with a high degree of internal inconsistency made up the scale, non-missing items were used to infer the score of the missing value (the scale total divided by the number of completed items is imputed for the missing item(s) at that time point).

The main study analyses comprise one set of hierarchical regression analyses which assessed the concurrent relationship between brooding (criterion variable) and insecure attachment orientations, defined as ‘internal working models which guide cognitive, emotional and behavioural responses in attachment related circumstances’ (Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009, p.605), assessed using two indexes: the Adult Rejection Sensitivity Questionnaire (ARSQ, Downey, Berenson, & Kang, 2006) and the Experiences in Close Relationships Questionnaire-Revised (ECR-R; Fraley, Waller, & Brennan, 2000, Brennan, Clark, & Shaver, 1997, copies of the self-

report questionnaire measures used in the thesis studies are included in the main thesis Appendices section, Appendix 2). A second set of hierarchical regression analyses assessed the concurrent relationship between brooding and maladaptive interpersonal styles (components comprised of maladaptive interpersonal behaviours, as assessed using the Inventory of Interpersonal Problems-64, IIP-64; Alden, Wiggins, & Pincus, 1990). The analyses reported in paper 2 included gender and depressive symptoms (assessed using the Beck Depression Inventory, Beck, Steer, & Brown, 1996) as control variables (entered at step 1 prior to entering the interpersonal variables at step 2). The analyses were replicated substituting reflection as the criterion variable in order to assess whether the effects were specific to the maladaptive brooding subcomponent, as hypothesised. The analyses were also replicated controlling for diagnostic status, assessed using the Structured Clinical Interview for DSM-IV: Mood Disorders Module (SCID; First, Spitzer, Gibbon, & Williams, 1997, see 4.10), as an alternative index of depression status. In addition, following collection of data from a different sample which comprised 79 clinically depressed adults (see Chapter 8 for further details about this sample), it was possible to replicate the analyses presented in the current chapter (see 4.11 supplementary analyses), enabling an evaluation of the extent to which the study 2 findings are reliable, and can be generalised to a clinical population.

As predicted, rumination (brooding but not reflection) was associated with an interpersonal style which incorporated submissive interpersonal behaviours. Moreover, the relationship between rumination and the submissive interpersonal style was maintained after statistically controlling for gender, depressive symptoms and other interpersonal styles. The same pattern of results was also replicated using a different

sample of data, which also enabled statistically controlling for generalised anxiety. Together, these results provide compelling evidence that rumination is specifically associated with submissive interpersonal behaviours. Whilst rumination is correlated with the needy and cold interpersonal styles, this relationship seems to reflect that both rumination and these maladaptive interpersonal styles are associated with elevated depressive symptoms (although this is less clear for the needy interpersonal style which was associated with brooding after controlling for gender and diagnostic status).

The results were somewhat less clear regarding the relationship between attachment orientation and rumination, whilst still providing some support for the stated hypotheses. The relationship between rumination and rejection sensitivity was approaching statistical significance ($p = .05$) after controlling for gender and depressive symptoms (a conservative test) in both sample 2 and 3. Interestingly, rumination was not associated with the anxious attachment style, although, this likely reflects key differences between these measures (an idea which is elaborated further in the thesis general discussion).

The results described in this chapter provide an important starting point for further examination of the temporal and causal nature of relationship between rumination rejection sensitivity and the submissive interpersonal style. These questions are examined further in the following chapters which incorporate a second time point of data collected from the same sample (six months post baseline) enabling a further assessment of the longitudinal relationship between rumination the submissive interpersonal style, rejection sensitivity and depression.

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publication to the journal of Behaviour Research and Therapy (BRAT), and has been revised and resubmitted to the journal following a first round of reviews.

Psychosocial correlates of depressive rumination

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4.2 Abstract

The study examined the relationship between brooding, the maladaptive sub-component of depressive rumination, an important cognitive mechanism implicated in the aetiology of depression, and a range of depressogenic psychosocial factors, including insecure attachment styles and maladaptive interpersonal behaviours. It was hypothesised that brooding (but not the more adaptive reflection component) is associated with an attachment pattern characterised by fear of rejection, and an interpersonal style characterised by submissiveness. Currently depressed ($n = 29$), previously depressed ($n = 42$) and never depressed ($n = 32$) adults completed self-report measures assessing depressive symptoms, rumination (brooding and reflection), attachment orientation and maladaptive interpersonal behaviours. The study hypotheses were partially supported: After controlling for gender and depressive symptoms, brooding was significantly associated with one indicator of underlying rejection concerns (rejection sensitivity, $p = .05$), but was not associated with another indicator of underlying rejection concerns (anxious attachment style). After controlling for depressive symptoms, brooding was uniquely associated with the submissive interpersonal style ($p < .01$). Brooding was not correlated with the needy interpersonal style after controlling for depressive symptoms.

Keywords: rumination, brooding, depression, interpersonal style, rejection sensitivity

4.3 Introduction

Rumination, defined as repetitive focus on depressive symptoms and their causes and meanings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), has been implicated in the onset and maintenance of depression, in both experimental and prospective longitudinal studies (for reviews see Nolen-Hoeksema, et al., 2008; Watkins 2008). Treynor, Gonzalez, and Nolen-Hoeksema (2003) distinguished between maladaptive brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’ (p.256), which prospectively predicted increase in depressive symptoms, and a more adaptive reflection factor, defined as actively attempting to gain insight into problems, which did not. Previous empirical studies indicate that brooding encapsulates the most harmful aspects of rumination (Burwell & Shirk, 2007; Treynor et al., 2003). Thus, brooding but not reflection has been found to prospectively predict depression in community adults (Treynor, et al., 2003), adolescents (Burwell & Shirk, 2007) and students (Olson & Kwon, 2008).

Similarly, there is a body of theory and supporting empirical evidence which indicates that interpersonal factors can confer vulnerability to depression. Indeed, Joiner, Coyne, and Blalock (1999, p.7) argued that ‘the strongest implication of the interpersonal approach is that depression not only has interpersonal features and consequences but also is fundamentally interpersonal in nature’. Interpersonal factors implicated in the aetiology of depression include insecure attachment orientations characterised by fear of rejection (anxious attachment style; Carnelley, Pietromonaco, & Jaffe, 1994, rejection sensitivity; Ayduk, Downey, & Kim, 2001) and specific maladaptive interpersonal behaviours, such as submissive behaviours (Allan & Gilbert, 1997; Cheung, Gilbert, & Irons, 2004; Irons & Gilbert, 2005), lack of assertiveness (Ball, Otto, Pollack, & Rosenbaum, 1994; Hirschfeld, Klerman,

Clayton, & Keller, 1983; Segal, 2005; Youngren & Lewinsohn, 1980), and excessive reassurance-seeking (Joiner & Metalsky, 2001; Joiner & Schmidt, 1998).

Given that rumination, insecure attachment styles, and maladaptive interpersonal behaviours are all implicated in the aetiology of depression, it is unsurprising that these processes are associated. In a sample of individuals with major depression, Lam, Schuck, Smith, Farmer, and Checkley (2003) found that rumination was significantly positively correlated with a spectrum of interpersonal difficulties related to control, assertiveness, submission, intimacy, and impaired social functioning. In another correlational study, rumination was associated with reduced relationship satisfaction in a sample of remitted depressed individuals (Kuehner & Bueger, 2005). These findings are consistent with the hypothesis that rumination is a “cognitive motor” contributing to the development of maladaptive interpersonal processes, such as excessive reassurance-seeking, passivity and poor social problem-solving (Joiner, 2000, p. 211).

However, a number of important questions remain unresolved about the relationship between interpersonal functioning and rumination in depression. First, is the relationship simply a result of their shared association with depressive symptoms? Second, is rumination generally associated with all forms of poor interpersonal functioning, or with specific interpersonal styles? Third, what is the causal direction between rumination and poor interpersonal functioning? This cross-sectional study attempts to answer the first two questions. Given an increasing interest in rumination and interpersonal functioning, it is clearly important to determine whether any association between rumination and interpersonal functioning is dependent upon shared variance with depression. Without this clarification, a literature could emerge which is built on unreliable foundations.

A closer examination of the rumination literature suggests the hypothesis that depressive rumination is associated with a specific subset of interpersonal difficulties and that this association is not solely due to shared associations with depression. First, Nolen-Hoeksema and Jackson (2001) argued that individuals who are preoccupied with maintaining close relationships are likely to engage in rumination as a form of hyper-vigilance to emotional states in self and others. Moreover, Saffrey and Ehrenberg (2007) hypothesised that rumination maintains awareness of vulnerability to abandonment, and that individuals who are sensitive to rejection are likely to ruminate in response to interpersonal loss, and to demonstrate a “difficulty overcoming depression and despair, resulting in preoccupation with the lost relationship” (p. 253). Thus, it is theoretically plausible both that rejection sensitivity might fuel rumination, and that rumination might activate underlying rejection concerns. Second, because rumination is a passive response mode implicated in both increased negative thinking and impaired interpersonal problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999), and reduced motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993), it is feasible that rumination is associated with a submissive interpersonal style. Thus, relevant theories suggest that there may be a bi-directional, relationship between rumination and an attachment orientation characterised by rejection concerns and interpersonal style characterised by passivity/submissiveness. Consistent with this hypothesis, there is a broad pattern of evidence suggesting that rumination is associated with an attachment orientation characterised by fear of rejection and submissive, overly-accommodating, non-assertive and self-sacrificing behaviours, First, rumination mediated the effect of attachment anxiety on how individuals responded to a relationship break-up, with rumination associated with increased

adjustment difficulties in anxiously attached individuals (Saffrey & Ehrenberg, 2007). Second, rumination was positively correlated with ‘unmitigated communion’, defined as “focus on others to the exclusion of self” (Helgeson, 1994, p.416), which reflects an undue sense of responsibility for maintaining the emotional tone of relationships (Nolen-Hoeksema & Jackson, 2001), Third, rumination was positively correlated with sociotropy, a measure assessing “motivation toward social-relatedness success”, in a student sample (Gorski & Young, 2002, p. 465).

Thus, there is some evidence consistent with the hypothesis that rumination is associated with an attachment orientation characterised by rejection sensitivity, and a submissive interpersonal style. However, there are a number of limitations to the existing data. First, some of the studies which have investigated psychosocial correlates of rumination did not control for level of depression (e.g., Gorski & Young, 2002) and a number utilized only non-clinical student samples (e.g., Gorski & Young, 2002; Saffrey & Ehrenberg, 2007) or only clinical samples (e.g., Lam, et al., 2003). Second, the majority of studies only assessed one or two interpersonal constructs rather than incorporating a range of measures that provide comprehensive coverage across the spectrum of interpersonal styles and behaviours. The inclusion of a range of interpersonal measures is necessary to determine whether rumination is associated with insecure attachment patterns generally or specifically the anxious attachment style, and to assess whether rumination is associated specifically with the submissive interpersonal styles, or whether rumination is also correlated with other maladaptive interpersonal styles, or whether the association with rumination is specific to one interpersonal style, which accounts for the variance of the other styles with rumination. Third, few studies have assessed patterns of interpersonal behaviour. This is an important omission because we would expect rumination and maladaptive

interpersonal behaviours to be influenced by underlying relationship concerns. For example, anxiety about rejection would be expected to trigger rumination and submissive and placating behaviours to prevent abandonment (Zuroff & Fitzpatrick, 1995). Fourth, whilst the findings are broadly consistent with rumination being associated with excessive relatedness concerns, there are some mixed findings: Spasojević and Alloy (2001) found a relationship between rumination and the self-critical style, whilst Gorski and Young (2002) found a relationship between rumination and autonomy, conceptually similar constructs assessing investment in independence and achievement-related goals.

The current study tested the hypotheses that: (a) rumination is associated with an attachment orientation characterised by fear of rejection; (b) rumination is associated with an interpersonal style characterised by submissive interpersonal behaviours. Importantly, we predicted that the relationship between rumination and these depressogenic interpersonal variables is not simply the consequence of a shared association with level of depression. Moreover, we predicted that the hypothesised relationships between rumination and these depressogenic interpersonal variables would be specifically attributable to the maladaptive brooding component, and that the predicted pattern of results would not be replicated with the reflection sub-scale. To test this hypothesis, the current study extended previous research by including a comprehensive range of interpersonal measures, by statistically controlling for depressive symptoms, by differentiating between brooding and reflection, and by selecting a mixed sample of currently depressed, formerly depressed, and never-depressed participants.

4.4 Method

4.4.1 Participants

Participants were recruited from a primary care service for depression ($n = 25$) and from the wider community, via a poster campaign which invited currently depressed, previously depressed and never depressed individuals to take part in the study ($n = 78$). The aim of this recruitment strategy was to maximize the variance of depressive symptoms, rumination, and social functioning impairment in the sample, and, thereby, enhance our ability to detect relationships between variables. Demographic characteristics of the sample are presented in Table 4.1. Exclusion criteria included a history of bipolar disorder, current substance dependence, psychotic symptoms, being unable to engage for physical or practical reasons, suicidal ideation, and persistent self injury requiring clinical management.

Table 4.1

Demographic Information and Mean (Standard Deviation) Scores by Group for Key Measures

Group	Current MDE ($n = 29$) $M (SD)$	Past MDE ($n = 42$) $M (SD)$	Never depressed ($n = 32$) $M (SD)$
Age	46.1 (13.8)	44.4 (17.0)	47.2 (17.3)
Female	19	30	22
Male	10	12	10
BDI	32.3 (11.4)	12.5 (10.8)	4.0 (4.4)
Brooding	14.3 (11.4)	12.5 (10.8)	4.0 (4.4)
Reflection	12.8 (3.2)	11.9 (3.0)	7.6 (3.0)

Note. BDI = Beck Depression Inventory-II, RRS = Ruminative Response Scale, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS, MDE = major depressive episode. Two participants (male) met criteria for current dysthymia, these were included within the current MDE group to facilitate between group comparisons.

4.4.2 Measures

Structured Clinical Interview for DSM-IV: Mood Disorders Module (SCID; First, Spitzer, Gibbon, & Williams, 1997). The SCID is a semi-structured diagnostic interview which is widely used in a clinical and research context to facilitate reliable DSM-IV diagnoses. There was an excellent level of inter-rater reliability for diagnoses of current depression ($\kappa = 1$) and past major depression ($\kappa = 1$) (blind independent rating of 10 randomly selected participants).

Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996). The BDI is a well-validated 21-item self-report questionnaire, which measures depressive symptom severity in the past two weeks. Participants rate their answers using a 0-3 scale with higher scores indicating greater depression severity (range 0-63). In this study, the BDI-II demonstrated high internal consistency ($\alpha = .96$).

Response Style Questionnaire (RSQ) - Ruminative Responses Scale (RRS; Nolen Hoeksema, 1991; Treynor, et al. 2003). The RSQ is a self-report measure which includes a 22 item Ruminative Response Scale (RRS), assessing the tendency to ruminate in response to depressed mood. Participants are asked to rate how often (1, almost never, 2, sometimes, 3, often, 4, almost always) they think and do different things when feeling down, sad or depressed, e.g. “Think ‘why can’t I get going?’”. In this study the RRS had a high level of internal consistency ($\alpha = .96$). Brooding was measured using five items from the RRS scale, e.g., “Think ‘why do I always react this way?’” ($\alpha = .85$). Reflection was measured using another five items from the RRS measure, e.g., “Analyse recent events to try and understand why you are depressed” ($\alpha = .86$).

The Inventory of Interpersonal Problems-64 (IIP-64; Alden, Wiggins, & Pincus, 1990). The IIP-64 is a self-report questionnaire measuring interpersonal

difficulties, with eight subscales derived from dimensions of affiliation (hostile/cold to friendly behaviour) and dominance (submissive to controlling behaviour):

Domineering (e.g., “I try to control other people too much”); Intrusive/Needy (e.g., “I find it difficult to spend time alone”); Self-Sacrificing (e.g., “I put other people’s needs before my own too much”); Overly-accommodating (e.g., “I let other people take advantage of me too much”); Non-assertive (e.g., “I find it difficult to let other people know what I want”); Socially inhibited (e.g., “I am too afraid of other people”); Cold (e.g., “I keep other people at distance too much”); Vindictive (e.g., “I am too suspicious of other people”). The IIP-64 was chosen because it enables assessment of a comprehensive spectrum of interpersonal behaviours. All subscales demonstrated good internal consistency: Domineering ($\alpha = .69$); Intrusive-needy ($\alpha = .76$); Self-sacrificing ($\alpha = .84$); Overly-accommodating ($\alpha = .82$); Non-assertive ($\alpha = .88$); Socially inhibited ($\alpha = .88$); Cold ($\alpha = .86$); Vindictive ($\alpha = .81$).

Adult Rejection Sensitivity Questionnaire (ARSQ; Downey, Berenson, & Kang, 2006). The ARSQ consists of nine hypothetical scenarios with the potential for rejection, involving interactions with partner, family, friends, and strangers, (e.g., “Lately, you’ve been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong”). For each of the scenarios, individuals rate the degree to which they are concerned about rejection and degree of anticipatory anxiety about rejection on two 6-point scales, resulting in nine composite rejection sensitivity scores being calculated for each individual, by multiplying the separate rejection anxiety and rejection expectation ratings assigned for each scenario. A total rejection sensitivity score is then derived for each participant, by computing the mean of these nine composite rejection scores. The scale demonstrated good internal consistency ($\alpha = .86$).

Experiences in Close Relationships Questionnaire-Revised (ECR-R; Fraley, Waller, & Brennan, 2000, Brennan, Clark, & Shaver, 1997). The ECR-R is a 36-item questionnaire which measures two dimensions of attachment style in romantic relationships: avoidance (discomfort with closeness and dependency; e.g., “I prefer not to show a partner how I feel deep down”) and anxiety (fear of abandonment; e.g., “I’m afraid that I will lose my partner’s love”). Individuals rate each item on a 7-point scale (1, disagree strongly – 7, agree strongly). Both sub-scales had good internal consistency (ECR Avoidance, $\alpha = .92$, ECR Anxiety, $\alpha = .91$).

Depressive Interpersonal Relationships Inventory – Reassurance Seeking Scale (DIRI-ERS; Joiner & Metalsky, 2001). The DIRI-ERS is a four-item sub-scale of the DIRI which measures frequency of engaging in excessive reassurance-seeking behaviours (e.g., “In general, do you find yourself often asking the people you feel close to how they truly feel about you?”) on a seven-point scale (1, no, not at all – 7, yes, very much). The scale had good internal consistency ($\alpha = .88$). Previous studies found cross-sectional and prospective relationships between excessive reassurance-seeking and depression (Starr & Davila, 2008).

4.4.3 Procedure

Participants were interviewed by the researcher to assess diagnostic status in the past week and then completed the battery of self-report questionnaires.

4.5 Results

4.5.1 Correlations between depression, rumination, and interpersonal factors

The correlation matrix was examined to identify inter-relationships between depressive symptoms, rumination, and the key psychosocial variables (Table 4.2). Depressive symptoms were significantly positively correlated with rumination, brooding, reflection, and all of the psychosocial variables. Rumination, brooding, and reflection were significantly positively correlated with all of the psychosocial variables and there were also significant positive correlations between the psychosocial variables. Gender was not significantly correlated with rumination, brooding, reflection, or the interpersonal variables.

Table 4.2

Inter-correlations between Depression, Rumination and Interpersonal Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. BDI	-	.78***	.73***	.56***	.55***	.50***	.58***	.48***	.51***	.67***	.67***	.61***	.42***	.45***	.42***	.45***	-.06
2. RRS		-	.92***	.83***	.46***	.52***	.55***	.41***	.40***	.57***	.60***	.53***	.43***	.49***	.47***	.40***	-.01
3. Brooding			-	.72***	.40***	.46***	.57***	.44***	.38***	.53***	.49***	.48***	.41***	.51***	.50***	.44***	.03
4. Reflection				-	.38***	.52***	.48***	.34***	.30**	.43***	.42***	.32**	.21*	.26**	.31**	.31**	.05
5. ECR-Avoid					-	.60***	.42***	.25*	.32***	.48***	.62***	.45***	.21***	.32***	.21***	.31***	.02
6. ECR-Anx						-	.65***	.45***	.30**	.36***	.52***	.50***	.39***	.45***	.39***	.37***	-.01
7. ARSQ							-	.51***	.42***	.50***	.50***	.63***	.54***	.55***	.59***	.40***	.05
8. DIRI-ERS								-	.42***	.38***	.37***	.38***	.32***	.38***	.39***	.46***	-.05
9. Domineering									-	.72***	.53***	.45***	.30***	.25***	.36***	.60***	.09
10. Vindictive										-	.77***	.61***	.36***	.31***	.33***	.53***	.16
11. Cold											-	.74***	.51***	.41***	.32***	.37***	-.01
12. Social inhibit												-	.75***	.58***	.42***	.26***	-.08
13. Non-assert													-	.80***	.60***	.32***	-.18
14. Over-acc														-	.82***	.40***	-.18
15. Self-sacrifice															-	.48***	-.08
16. Intrusive																-	.07
17. Gender																	-

Note. $N = 93-101$ due to missing data BDI = Beck Depression Inventory-II, RRS = Ruminative Response Scale, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS, ECR-Avoid = Experiences in Close Relationships – Avoidance sub-scale, ECR-Anx = Experiences in Close Relationships – Anxiety sub-scale, ARSQ = Adult Rejection Sensitivity Questionnaire, DIRI-ERS = Depressive Interpersonal Relationships Inventory – Reassurance Seeking Scale, Domineering = Domineering sub-scale of the Inventory of Interpersonal Problems Questionnaire, Vindictive = Vindictive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Cold = Cold sub-scale of the Inventory of Interpersonal Problems Questionnaire, Social inhibit = Socially inhibited sub-scale of the Inventory of Interpersonal Problems Questionnaire, Non-assert = Non assertive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Over-acc = Overly-accommodating sub-scale of the Inventory of Interpersonal Problems Questionnaire, Self-sacrifice = Self-sacrificing sub-scale of the Inventory of Interpersonal Problems Questionnaire, Intrusive = Intrusive sub-scale of the Inventory of Interpersonal Problems Questionnaire. * $p < .05$, ** $p < .01$, *** $p < .001$

4.5.2 *Principal Components Analysis*

Because of the multicollinearity between the psychosocial variables and the large number of potential factors to investigate, we calculated a Principal Components Analysis (direct oblimin oblique rotation) on the nine psychosocial variables which measured interpersonal behaviours in order to determine if there were common behavioural components (Table 4.3). Tabachnick and Fidell (2001) recommend that this approach is adopted when the aim is to reduce a large number of variables down to smaller components. An oblique rotation is recommended when theory suggests that underlying constructs are correlated, as reported (Table 4.2). Kaiser's criterion was applied, so that components with eigenvalues greater than one were retained.

Three interpersonal behaviour components were extracted, accounting for 80.71% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .80, which indicated that the solution obtained produced distinct and reliable factors¹. Component 1, henceforward labelled "submissive interpersonal style" (eigenvalue = 3.27 after rotation) had three items with salient loadings (> .5): the IIP subscales concerned with overly-accommodating, non-assertive, and self-sacrificing behaviours. Component 2, henceforward labelled "needy interpersonal style" (eigenvalue = 2.85 after rotation), had three items with salient loadings (>.5): the IIP intrusive-needy and domineering sub-scales and excessive reassurance-seeking. Component 3, henceforward labelled "cold interpersonal style" (eigenvalue = 3.38 after rotation) had three items with salient loadings (> .5): IIP cold, vindictive and socially inhibited sub-scales. Component scores were computed in SPSS using the regression method. Due to reverse coding of the submissive interpersonal style, the negative coefficient indicates that higher levels of submissiveness were associated with increased rumination.

The measures of rejection sensitivity and insecure attachment style were not included in the Principal Components Analysis, and were examined separately in the subsequent analyses, because it was not expected that these variables, which assess underlying attachment orientation, (i.e., internal representations of oneself and others which guide behaviour and feelings in social relationships, Sadava, Busseri, Molnar, Perrier, & DeCourville, 2009; Saffrey & Ehrenberg, 2007), would load reliably onto interpersonal components comprised of specific interpersonal behaviours (i.e., high anxious attachment might be associated with either excessively needy or submissive interpersonal behaviours).

Table 4.3

Obliquely Rotated (Direct Oblimin) Factor Loadings and Communalities for the 3 Factor Solution

Item	Submissive style	Needy style	Cold style	h^2
DIRI-ERS	-.21	.62	.01	.51
Domineering	.15	.66	.45	.76
Vindictive	.13	.36	.78	.87
Cold	-.08	.04	.88	.85
Social inhibit	-.44	-.15	.75	.88
Non-assert	-.82	-.13	.32	.87
Over-acc	-.92	.11	.03	.92
Self-sacrifice	-.77	.39	-.14	.82
Intrusive	-.09	.85	.01	.78

Note. The first three eigenvalues were 3.27, 2.85 and 3.38. Loadings > .5 in bold. DIRI-ERS = Depressive Interpersonal Relationships Inventory – Reassurance Seeking Scale; Domineering = Domineering sub-scale of the Inventory of Interpersonal Problems Questionnaire, Vindictive = Vindictive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Cold = Cold sub-scale of the Inventory of Interpersonal Problems Questionnaire, Social inhibit = Socially inhibited sub-scale of the Inventory of Interpersonal Problems Questionnaire, Non-assert = Non assertive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Over-acc = Overly-accommodating = sub-scale of the Inventory of Interpersonal Problems Questionnaire, Self-sacrifice = Self-sacrificing sub-scale of the Inventory of Interpersonal Problems Questionnaire, Intrusive = Intrusive sub-scale of the Inventory of Interpersonal Problems Questionnaire

4.5.3 *The relationship between rumination and attachment orientation*

In order to test the hypothesis that rumination is associated with an attachment orientation characterised by fear of rejection we calculated two hierarchical regression models, in which brooding and reflection were criterion variables respectively². In each model, gender and level of depression (BDI score) were entered at step 1 as control variables, and rejection sensitivity (ARSQ) and the adult attachment style variables, anxious attachment style (ECR-Anx) and avoidant attachment style (ECR-Avoid) were entered at step 2. SPSS diagnostics were examined to ensure that the hierarchical regression models were not biased due to multi-collinearity or the influence of outliers and residuals (Diagnostics indicated that all VIF < 10, all tolerance statistic > .2 and there were no standardized residuals with an absolute value > .3) and that the assumption of independent errors was met (Durbin Watson = 1.88 when brooding was the criterion variable and 1.93 when reflection was the criterion variable).

Together, gender and level of depressive symptoms explained a significant proportion of the variance in brooding, $R^2 = .52$ ($R^2_{\text{adj}} = .50$), and the overall model was statistically significant $F(2, 85) = 45.23, p < .001$. Gender was not significantly correlated with brooding, $\beta = .31, t(85) = .45, p = .80$. Level of depressive symptoms was associated with brooding, $\beta = .21, t(85) = 9.51, p < .001$. Adding the insecure attachment styles and rejection sensitivity together at step 2 did not significantly improve the model, $F(5, 82) = 20.16, p < .001$. One of the individual variables assessing attachment orientation, rejection sensitivity, was approaching a statistically significant association with brooding at step 2, $\beta = .18, t(82) = 1.98, p = .05$. Neither the anxious attachment style, $\beta = .11, t(82) = .32, p = .75$, nor avoidant attachment

style, $\beta = -.28$, $t(82) = -.82$, $p = .41$, were associated with brooding after controlling for gender and depressive symptoms.

A second hierarchical regression was calculated with reflection as the criterion variable. Together, gender and level of depressive symptoms explained a significant proportion of the variance in reflection, $R^2 = .27$ ($R^2_{\text{adj}} = .26$), and the overall model was statistically significant $F(2, 85) = 16.04$, $p < .001$. Gender was not significantly correlated with reflection, $\beta = .21$, $t(85) = .29$, $p = .82$. Level of depressive symptoms was associated with reflection, $\beta = .13$, $t(85) = 5.67$, $p < .001$. Adding the insecure attachment styles and rejection sensitivity at step 2 did not significantly improve the model, $\Delta R^2 = .07$, $p = .07$, although the overall model was significant, $F(5, 82) = 8.48$, $p < .05$. None of the individual variables assessing attachment orientation were statistically significantly associated with reflection at step 2, rejection sensitivity, $\beta = -.10$, $t(82) = 1.08$, $p = .28$, anxious attachment style, $\beta = .54$, $t(82) = 1.59$, $p = .12$, avoidant attachment style, $\beta = -.06$, $t(82) = -.16$, $p = .87$, after controlling for gender and depressive symptoms.

4.5.4 The relationship between rumination and maladaptive interpersonal styles

In order to test the hypotheses that rumination is associated with the submissive interpersonal style we calculated two hierarchical regression models, in which brooding and reflection were criterion variables respectively³. In each model, gender and level of depression (BDI score) were entered at step 1 as control variables, and the submissive, needy and cold interpersonal styles (computed component scores) were entered at step 2. SPSS diagnostics were examined to ensure that the hierarchical regression models were not biased due to multi-collinearity or the influence of outliers and residuals (Diagnostics indicated that all VIF < 10 , all tolerance statistic $> .2$ and there were no standardized residuals with an absolute value $> .3$) and that the

assumption of independent errors was met (Durbin Watson = 2.03 when brooding was the criterion variable and 1.84 when reflection was the criterion variable).

Together, gender and level of depressive symptoms explained a significant proportion of the variance in brooding, $R^2 = .53$ ($R^2_{adj} = .52$), and the overall model was statistically significant $F(2, 95) = 53.36, p < .001$. Gender was not significantly correlated with brooding, $\beta = .49, t(95) = .73, p = .47$. Level of depressive symptoms was associated with brooding, $\beta = .21, t(95) = 10.33, p < .001$. Adding the maladaptive interpersonal style variables at step 2 significantly improved the model, $\Delta R^2 = .06, p < .01$, and the overall model was statistically significant, $F(5, 92) = 25.93, p < .001$. The submissive interpersonal style was significantly associated with brooding, $\beta = -.92, t(92) = -2.85, p < .01$. Neither the needy, $\beta = .59, t(92) = 1.74, p = .09$, nor cold, $\beta = -.07, t(92) = -.19, p = .85$, interpersonal styles were significantly associated with brooding.

A second hierarchical regression was run with reflection as the criterion variable. Together, gender and level of depressive symptoms explained a significant proportion of the variance in reflection, $R^2 = .33$ ($R^2_{adj} = .32$), and the overall model was statistically significant $F(2, 95) = 23.63, p < .001$. Gender was not significantly correlated with reflection, $\beta = .75, t(95) = 1.10, p = .28$. Level of depressive symptoms was associated with reflection, $\beta = .15, t(95) = 6.87, p < .001$. Adding the maladaptive interpersonal style variables at step 2 did not significantly improve the model, $\Delta R^2 = .01, p = .58$, although the overall model was statistically significant, $F(5, 92) = 9.75, p < .001$. None of the maladaptive interpersonal styles were significantly associated with reflection: submissive interpersonal style, $\beta = -.04, t(92) = -.12, p = .90$; needy interpersonal style, $\beta = .49, t(92) = 1.33, p = .19$; cold interpersonal style, $\beta = .16, t(92) = .37, p = .71$.

Table 4.4

Summary of Hierarchical Regression Analyses (final step) With Brooding as the Criterion Variable

Step	Predictor	B	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 2	Gender	.18	.26	.52	.04	82
	BDI	.18	6.00***			
	ECR-Avoid	-.28	-.82			
	ECR-Anx	.11	.32			
	ARSQ	.18	1.98*			
Step 2	Gender	.69	1.05	.56	.06**	92
	BDI	.17	5.87***			
	Cold	-.07	-.19			
	Submissive	-.92	-2.85**			
	Needy	.59	1.74			

Note. BDI = Beck Depression Inventory, ECR-Anx = Anxiety sub-scale of the ECR, ECR-Avoid = Avoidance sub-scale of the ECR, ARSQ = Adult Rejection Sensitivity Questionnaire, Cold = cold interpersonal style, Submissive = submissive interpersonal style, Needy = needy interpersonal style.

* $p \leq .05$, ** $p < .01$, *** $p < .001$

4.6. Discussion

As predicted, after controlling for gender, level of depressive symptoms and the other maladaptive interpersonal styles (cold and needy interpersonal styles), rumination (brooding but not the more adaptive reflection sub-component) was uniquely associated with an interpersonal style which encapsulated submissive (overly-accommodating, non-assertive and self-sacrificing) behaviours. As predicted, neither the needy or cold interpersonal styles were associated with rumination, after controlling for gender, level of depressive symptoms and the other interpersonal styles. Partially consistent with our first hypothesis, rumination (brooding but not the more adaptive reflection sub-component) was most strongly associated with increased rejection sensitivity ($p = .05$), after controlling for gender and level of depressive symptoms. However, rumination was not associated with the anxious attachment style, another index of rejection fears. This lack of a significant relationship between

rumination and the anxious and avoidant attachment styles and the needy and cold interpersonal styles suggests that the associations found between these interpersonal constructs and rumination in Table 4.2 may be due to their shared association with depression and/or the other interpersonal factors.

The findings are broadly consistent with and extend previous knowledge about rumination. First, the current findings are consistent with the hypothesis that depressive rumination is associated with a specific subset of interpersonal difficulties rather than interpersonal difficulties generally. The results also suggest that this association is not solely due to shared associations with depression. Moreover, these findings provide convergent evidence using a more robust and conservative methodology (controlling for depression and other interpersonal styles) that rumination is specifically associated with rejection sensitivity and an interpersonal style characterised by submissiveness. Importantly, these results suggest that rumination is associated with particular aspects of interpersonal style (rejection sensitivity and submissive interpersonal behaviours) but not with other aspects of interpersonal style (intimacy avoidance, needy interpersonal behaviours and cold interpersonal behaviours), after controlling for level of depression. This has considerable implications for theoretical models of how rumination and interpersonal functioning interact by indicating that rather than being associated with a general deficit, rumination is associated with a specific pattern of interpersonal style. This indicates that theoretical models which underpin current understanding of the interpersonal context of rumination (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004) need to consider a more circumscribed mechanism linking rumination and interpersonal style. Moreover, as the first examination of how rumination relates to a wide spectrum of interpersonal behaviours after controlling for depression, the

current findings have implications for the interpretation and design of studies investigating rumination and interpersonal functioning. By its wide inclusion of interpersonal measures, the current study suggests that previous studies that only examined a single interpersonal variable and found a relationship with rumination (e.g., excessive reassurance-seeking) may simply reflect the association between that variable and depression or between that variable and the non-assertive, rejection-sensitive style, rather than a direct relationship between that variable and rumination. Thus, these previous findings should be treated cautiously until replicated in the context of other interpersonal variables being measured.

Second, these results provide further evidence that brooding is a more maladaptive form of rumination than reflection (e.g., Treynor, et al., 2003). In the current study, brooding was correlated with rejection sensitivity and the submissive interpersonal style, whereas reflection was not. Thus, the results highlight the importance of conceptualizing rumination as a complex construct which incorporates different dimensions which are not equally as strongly associated with maladaptive interpersonal styles.

Third, the association between rumination and the submissive interpersonal style is broadly consistent with research which has conceptualised depressive rumination as a maladaptive form of avoidance (Martell, Addis, & Jacobson, 2000; Watkins, et al., 2007), and found it to be correlated with measures of avoidance (Moulds, Kandris, Starr, & Wong, 2007). For example, Nolen-Hoeksema, et al., (2008, p. 407) argued that rumination may serve an avoidant function by building “a case that the individual is facing a hopelessly uncontrollable situation and so he or she is not able to take action to overcome the situation”. Non-assertive and overly-accommodating behaviours are a form of avoidance often found in depression, and

their association with rumination strengthens the argument that rumination has an avoidant function.

The findings did not replicate previous results which indicated that depressive rumination was correlated with the needy interpersonal style (Spasojević & Alloy, 2001) and excessive reassurance-seeking (Weinstock & Whisman, 2007). Nor were our findings consistent with previous studies that found an association between rumination and excessive autonomy concerns and cold/distant interpersonal behaviours (e.g., Gorski & Young, 2002; Spasojević & Alloy, 2001). We note that one reason for this discrepancy may be that previous studies had not adequately controlled for shared variance with depressive symptoms and/or a range of interpersonal difficulties. Moreover, the samples in the majority of these previous studies did not include a heterogeneous mix of depressed and non-depressed individuals, thereby reducing statistical power to control for level of depression. The findings emphasise the value of assessing and then statistically controlling for depression and a range of interpersonal behaviours before concluding that rumination is associated with any particular aspect of interpersonal functioning.

The findings also raise the question why was rumination associated with rejection sensitivity but not the anxious attachment style? This discrepancy might reflect important differences between the two measures. Whilst the ARSQ and the ECR-R both assess underlying concerns about rejection, only the ARSQ assesses the tendency to both *fear* and *anxiously expect* rejection. Thus, a possibility in need of further investigation is that it is this anxious expectation of rejection which is specifically associated with rumination. Another difference between the ARSQ and the ECR-R measures is that the ECR-Anxious measure is specifically focused on romantic relationships, whereas the ARSQ assesses sensitivity to rejection more

generally. Although the ECR-R is intended to be useable by individuals who are not currently involved in a romantic relationship, some of the participants who were not currently involved in a romantic relationship at the time of participating in the study reported finding it difficult to complete this questionnaire, raising questions about its validity within this group.

The finding that depressive rumination is associated with a specific subset of interpersonal difficulties has potential implications for clinical assessment and treatment. First, this finding suggests that when a clinician identifies either rumination or the interpersonal style characterised by passive behaviour and rejection-sensitivity in a patient, they should be alert to the likelihood that the other difficulty is present, assess for this other difficulty, and examine their relationship when developing an individualised formulation. Second, this association raises the possibility that treatment interventions focused on resolving one identified problem may also reduce the other problem (e.g., assertiveness training might reduce rumination), although this is subject to determining the causal direction between rumination and the non-assertive, rejection-sensitive style.

The current study has a number of limitations. First, the cross-sectional design was not intended to resolve the causal relationship between rumination and interpersonal difficulties. Depressive rumination might lead to submissiveness through negatively biasing interpersonal cognitions, inhibiting interpersonal problem solving, and reducing initiative and motivation. Alternatively, overly-accommodating, non-assertive, and self-sacrificing behaviours may fuel further rumination because submissiveness to others is likely to generate conflict between maintaining personal goals and the need to maintain relationships (O'Mahen, Flynn, & Nolen-Hoeksema, in press). We speculate that the likeliest causal relationship is bidirectional, such that a

vicious cycle between rumination and interpersonal concerns and behaviour can easily develop, with each further fuelling the other, and exacerbating depression. Further prospective longitudinal studies examining the temporal course of rumination and interpersonal styles and/or experimental studies manipulating rumination or interpersonal functioning are necessary to determine the direction of causality.

Second, the study relied on self-report measures to index interpersonal difficulties, with the possibility of inaccurate or biased responses. Future research could usefully incorporate direct observation (e.g., role-play, naturalistic observation) or 'real-time' experience-sampling methods to more objectively assess interpersonal style.

In conclusion, these findings contribute towards an emerging understanding of the relationship between depressive rumination and specific interpersonal styles and behaviours implicated in the aetiology of depression. More specifically, the findings suggest that rumination is associated with a submissive interpersonal style and rejection sensitivity. These results extend and clarify previous findings, which suggested a more general association between rumination and interpersonal difficulties, and provide a starting point for further investigation to increase understanding of the temporal and causal nature of these two important vulnerability factors for depression.

Footnotes

¹ In order to test the robustness of the PCA solution (taking account of the small sample size) the PCA analysis was replicated with 10% of the sample randomly deleted from the analysis. Similar results were obtained with this smaller sample. To further evaluate solution stability, we ran an equivalent analysis using Principal Axes Factoring. A similar factor structure was attained using this alternative method.

² We replicated the analyses using the whole rumination scale. Together, gender and level of depressive symptoms explained a significant proportion of the variance in rumination, $R^2_{\text{adj}} = .56$, and the overall model was statistically significant $F(2, 85) = 57.21, p < .001$. Gender was not significantly correlated with rumination, $\beta = -.60, t(85) = -.23, p = .82$. Level of depressive symptoms was associated with rumination, $\beta = .87, t(85) = 10.68, p < .001$. Adding the insecure attachment styles and rejection sensitivity at step 2 did not significantly improve the model, $\Delta R^2 = .02, p = .21$, although the overall model was significant, $F(5, 82) = 24.23, p < .001$. None of the individual variables assessing attachment orientation were statistically significantly associated with rumination at step 2, rejection sensitivity, $\beta = .40, t(82) = 1.98, p = .24$, anxious attachment style, $\beta = 1.06, t(82) = .87, p = .39$, avoidant attachment style, $\beta = -.36, t(82) = -.29, p = .78$, after controlling for gender and depressive symptoms.

³ We replicated the analyses using the whole rumination scale. Together, gender and level of depressive symptoms explained a significant proportion of the variance in rumination, $R^2 = .60$ ($R^2_{\text{adj}} = .59$), and the overall model was statistically significant $F(2, 95) = 70.63, p < .001$. Gender was not significantly correlated with rumination, β

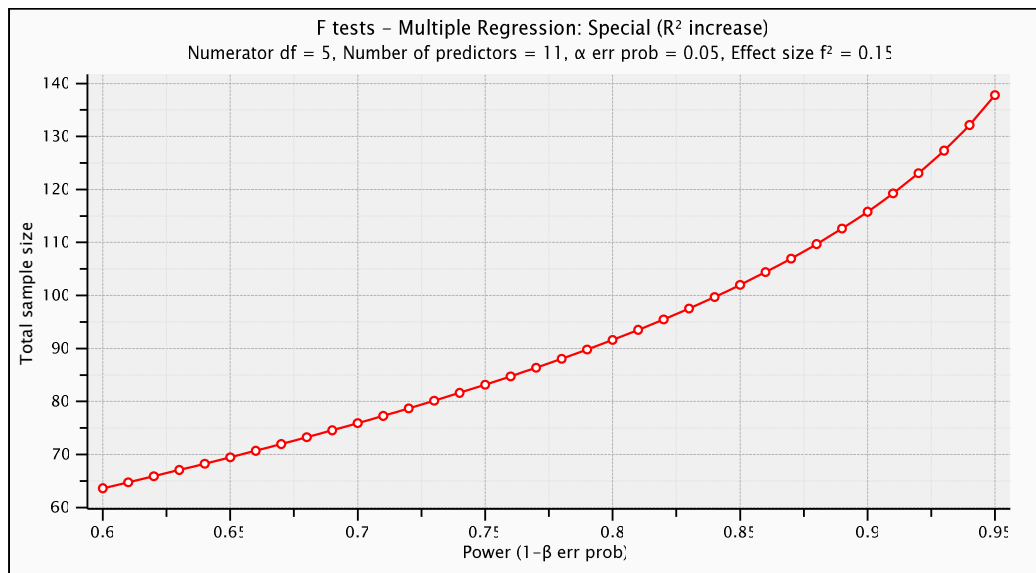
= .72, $t(95) = .30$, $p = .78$. Level of depressive symptoms was associated with rumination, $\beta = .90$, $t(95) = 11.85$, $p < .001$. Adding the maladaptive interpersonal style variables at step 2 did not significantly improve the model, $\Delta R^2 = .03$, $p = .06$, although the overall model was statistically significant, $F(5, 92) = 31.15$, $p < .001$. The submissive interpersonal style was associated with rumination, $\beta = -2.72$, $t(92) = -2.34$, $p < .05$. Neither the needy interpersonal style, $\beta = .94$, $t(92) = .74$, $p = .46$, nor the cold interpersonal style, $\beta = 1.50$, $t(92) = 1.03$, $p = .30$, were associated with rumination.

4.7 Appendix A: A priori power analysis

Prior to data collection for the study an a priori power analysis was undertaken (using G Power application) to estimate the number of participants required to minimize the risk of Type II error. For the purposes of estimating the required sample size, the following simplifying assumptions were applied; medium effect size ($f^2=0.15$), $\alpha = .05$, $\beta = .90$, five variables being tested, 11 independent variables total (the a priori analyses allowed for the possibility that the IIP sub-scales would be entered separately). In order to satisfy these assumptions it was estimated that a sample of 116 participants was required (Figure 4.1).

Figure 4.1:

A Priori Power Analysis



4.8 Appendix B: Post hoc power analyses

Because a smaller sample than planned was recruited (as based on the a priori power analyses), post hoc analyses were undertaken to evaluate the actual power obtained for the two main analyses: a) attachment orientation explains variance in concurrent brooding; b) interpersonal styles explain variance in concurrent brooding. These indicated that for analysis a) the obtained power was .56, $f^2 = .08$ (figure 4.2) and for analysis b) the obtained power was .79, $f^2 = .11$ (figure 4.3).

Figure 4.2

Post-hoc Power Analysis: Attachment Style Explains Variance in Brooding

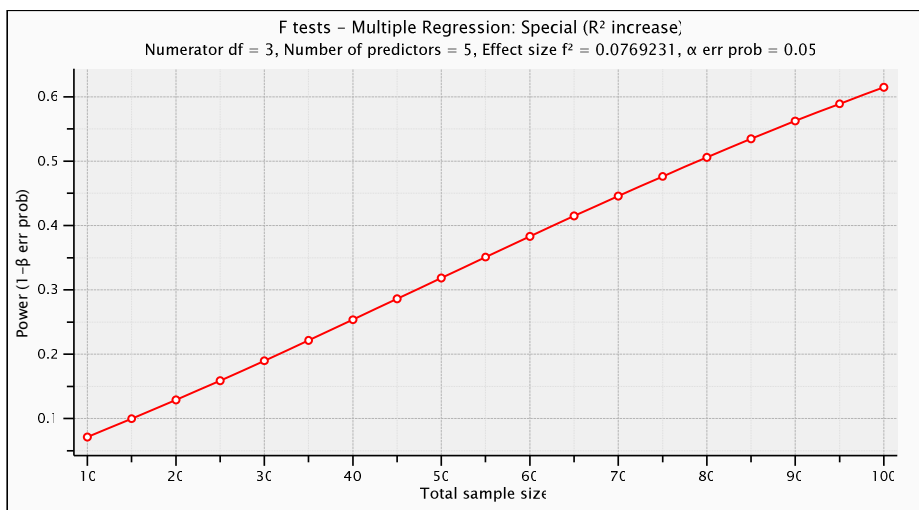
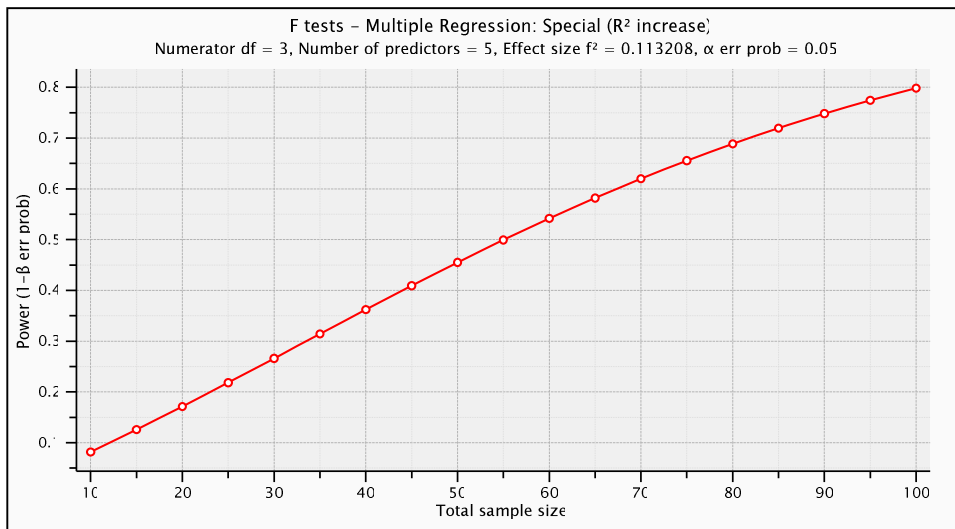


Figure 4.3

Post-hoc Power Analysis: Interpersonal Style Explains Variance in Brooding



4.9 Appendix C: Correlation between self and partner report of maladaptive interpersonal
behaviour

As a mechanism for assessing the extent to which depression vulnerable individuals self-report of maladaptive interpersonal behaviours is influenced by a negative reporting bias, partner report of interpersonal difficulties (using an adapted version of the Inventory of Interpersonal Problems, Foltz, Morse, & Barber, 1999) was collected from a sub-set of sample 2 (those participants who had partners and who consented for their partner to be involved with the study (Table 4.5). Substantial agreement was reported between partner and self report of interpersonal difficulties.

Table 4.5

Inter-correlations between Self and Partner Ratings of Maladaptive Interpersonal Behaviours

IIP Sub-scale	Correlation between self and partner rating
1. Domineering	.57***
2. Vindictive	.71***
3. Cold	.61***
4. Social inhibit	.57***
5. Non-assert	.71***
6. Over-acc	.54***
7. Self-sacrifice	.40***
8. Intrusive	.47***

Note. $N = 41-43$ due to missing data Domineering = Domineering sub-scale of the Inventory of Interpersonal Problems Questionnaire, Vindictive = Vindictive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Cold = Cold sub-scale of the Inventory of Interpersonal Problems Questionnaire, Social inhibit = Socially inhibited sub-scale of the Inventory of Interpersonal Problems Questionnaire, Non-assert = Non assertive sub-scale of the Inventory of Interpersonal Problems Questionnaire, Over-acc = Overly-accommodating sub-scale of the Inventory of Interpersonal Problems Questionnaire, Self-sacrifice = Self-sacrificing sub-scale of the Inventory of Interpersonal Problems Questionnaire, Intrusive = Intrusive sub-scale of the Inventory of Interpersonal Problems Questionnaire. *** $p < .001$

4.10 Appendix D: Replication of analyses controlling for diagnostic status

An equivalent pattern of results was obtained when the hierarchical regression models were replicated but controlling for diagnostic status rather than depressive symptoms (Table 4.5). However, one difference was that, controlling for diagnostic status rather than depressive symptoms, the needy interpersonal style retained a significant association with brooding (which was not the case when statistically controlling for depressive symptoms).

This finding reflects that there is a stronger association between the needy interpersonal style and depressive symptoms ($R = .50, p < .001$) than between the needy interpersonal style and depression status (current MDE, $R = .30, p < .001$). Moreover, depressive symptoms accounts for a greater proportion of variance in brooding ($R^2 = .52$) than diagnostic status ($R^2 = .42$), so that there is more power to detect a relationship between rumination and the needy interpersonal style controlling for diagnostic status, rather than depressive symptoms. Thus, controlling for depressive symptoms (rather than diagnostic status) represents a more conservative test of the relationship between rumination and interpersonal style (and therefore depressive symptoms, BDI, was included as a control variable in the analyses which were included in the main paper).

However, examination of this alternative model clarifies that the weakest relationship is between rumination and the cold interpersonal style (non-significant association with rumination controlling for either depressive symptoms or diagnostic status), the strongest relationship is between rumination and the submissive interpersonal style, and that there is an association between rumination and the needy interpersonal style, but that this is better explained due to shared variance with depressive symptoms.

Table 4.6

Summary of Supplementary Hierarchical Regression Analyses (final step) With Brooding as the Criterion Variable, Controlling for Diagnostic Status

Step	Predictor	B	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	Gender	.36	.48	.40	.42***	86
	Current depression	2.78	3.26**			
	Past depression	4.31	5.23***			
Step 2	Gender	.14	.20	.49	.010**	83
	Current depression	1.56	1.81			
	Past depression	3.57	4.35***			
	ECR-Avoid	.32	.96			
	ECR-Anx	-.30	-.85			
	ARSQ	.31	3.56**			
Step 1	Gender	.180	.25	.41	.42***	95
	Current depression	2.56	3.14**			
	Past depression	4.50	5.68***			
Step 2	Gender	.41	.60	.51	.12***	92
	Current depression	1.51	1.85			
	Past depression	3.39	4.35***			
	Cold	.21	.56			
	Submissive	-.95	-2.74**			
	Intrusive	1.06	3.17**			

Note. Current depression = Current depression status (currently depressed/not currently depressed), Past depression = Past depression status (history of past major depression/no history of past major depression) ECR-Anx = Anxiety sub-scale of the ECR, ECR-Avoid = Avoidance sub-scale of the ECR, ARSQ = Adult Rejection Sensitivity Questionnaire Cold = cold interpersonal style, Submissive = submissive interpersonal style, Needy = needy interpersonal style. * $p < .05$, ** $p < .01$, *** $p < .001$

4.11 Appendix E: Replication of analyses with a different sample

The main analyses reported in chapter 4 were subsequently replicated using the sample 3 baseline data (see chapter 8 for details of the sample composition, $N = 79$ clinically depressed adults). Using this sample enabled statistically controlling for shared variance with generalised anxiety symptoms (assessed using the GAD-9, a widely used self-report questionnaire which assesses generalised anxiety symptoms). A similar pattern of results was obtained as that reported using the sample 2 data, as summarised below.

4.9.1 Sample 3 analysis 1: Does rejection sensitivity explain variance in brooding?

Together, gender, level of depressive symptoms, and generalised anxiety explained a significant proportion of the variance in brooding, $R^2 = .39$ ($R^2_{\text{adj}} = .36$), and the overall model was statistically significant $F(3, 68) = 14.43, p < .001$. Gender was not significantly correlated with brooding, $\beta = .01, t(68) = .02, p = .99$. Level of depressive symptoms was associated with brooding, $\beta = .11, t(68) = 2.68, p < .01$. Generalised anxiety symptoms were associated with brooding, $\beta = .28, t(68) = 3.58, p < .01$. Adding rejection sensitivity at step 2 did not significantly improve the model, $\Delta R^2 = .03, p = .09$, although the overall model was statistically significant, $F(4,67) = 11.82, p = .09$. (The ECR-R measure of adult attachment was not included in sample 3 due to non-significant results in this current study/sample 2). The relationship between rejection sensitivity and brooding was not statistically significant after controlling for gender, depressive symptoms and anxiety symptoms, $\beta = .11, t(67) = 1.68, p = .10$.

4.9.2 Sample 3 analysis 2: Do maladaptive interpersonal styles explain variance in brooding?

Together, gender and level of depressive symptoms explained a significant proportion of the variance in brooding, $R^2 = .41$ ($R^2_{\text{adj}} = .39$), and the overall model was statistically significant $F(3, 64) = 15.02, p < .001$. Gender was not significantly correlated with brooding, $\beta = -.09, t(64) = -.12, p = .91$. Level of depressive symptoms was associated with brooding, $\beta = .12, t(64) = 2.87, p < .01$. Generalised anxiety symptoms were associated with brooding, $\beta = .29, t(64) = 3.53, p < .01$. Adding the maladaptive interpersonal style variables at step 2 significantly improved the model, $\Delta R^2 = .08, p < .05$, and the overall model was statistically significant, $F(6, 61) = 9.87, p < .001$.

Replicating the previous analyses, the submissive interpersonal style was significantly associated with brooding, $\beta = -.91, t(61) = -2.44, p < .05$. Neither the needy, $\beta = .14, t(61) = .92, p = .37$, nor cold, $\beta = .77, t(61) = 1.78, p = .08$, interpersonal styles were significantly associated with brooding.

Table 4.7

Replication of cross-sectional analyses with Sample 3 data (N = 79 clinically depressed adults)

Step	Predictor	B	t	R ² _{adj}	ΔR ²	df
Step 1	Gender	.01	.02	.36	.39***	68
	BDI	.11	2.68**			
	GAD	.28	3.58***			
Step 2	Gender	.23	.31	.38	.03	67
	BDI	.10	2.45			
	GAD	.27	3.56			
	ARSQ	.11	1.68**			
Step 1	Gender	-.09	-.12	.39	.41***	64
	BDI	.12	2.87**			
	GAD	.29	3.53***			
Step 2	Gender	-.16	-.22	.44	.08*	61
	BDI	.11	2.76			
	GAD	.21	2.50			
	Cold	.77	1.78			
	Submissive	-.91	-2.44*			
	Needy	.14	.92			

Note. BDI = Beck Depression Inventory, GAD = Generalised Anxiety Disorder 7 Questionnaire, ARSQ = Adult Rejection Sensitivity Questionnaire, Cold = cold interpersonal style, Submissive = submissive interpersonal style, Intrusive = intrusive-needy interpersonal style. $p < .05$, ** $p < .01$, *** $p < .001$

CHAPTER 5: Submissive interpersonal style and rumination predict future depression

5.1 Preface

The study presented in chapter 5 (study 3) evaluates the thesis hypothesis that rumination and the submissive interpersonal style prospectively predict increased depressive symptoms (Hypothesis 5). More specifically, it was predicted that: (a) rumination (brooding but not reflection) would prospectively predict increased depression; (b) the submissive interpersonal style would be the strongest interpersonal predictor of future depressive symptoms; (c) the effect of the submissive interpersonal style on depression would be mediated by rumination.

Study 3 builds on results reported in chapter 4, which indicated that rumination is associated concurrently with the submissive interpersonal style. If this concurrent relationship between rumination and the submissive interpersonal style had not been demonstrated, the first criteria for mediation (Baron & Kenny, 1986), i.e., that the independent variable (submissive interpersonal style) is significantly associated with the proposed mediator (brooding), would not have been satisfied. The main body of the chapter consists of a paper summarizing the study findings which is currently under revision at Behaviour Research and Therapy.

Study 3 includes an additional assessment point approximately six months following the baseline assessment. Importantly, incorporating this additional assessment point enabled an evaluation of the temporal relationship between rumination and key interpersonal factors in predicting future depressive symptoms. A small number of the original sample did not complete the follow-up assessment ($n = 11$). This sub-group were more depressed and had higher levels of brooding and interpersonal difficulties than

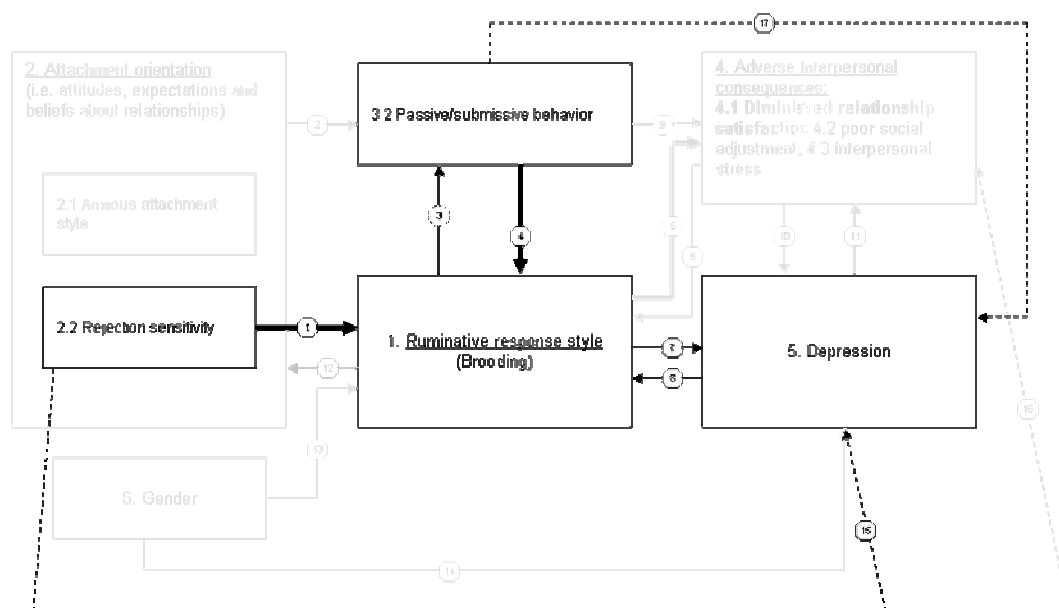
those who were retained to follow up (88%, $n = 81$), although these between group differences were not statistically significant (section 5.9 Appendix B).

A key prediction of the RST (Nolen-Hoeksema, 1991) is that rumination is involved in the onset and maintenance of depression. Although this hypothesis is supported by findings from previous studies (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Spasojević & Alloy, 2001), to date, no previous study has examined whether brooding prospectively predicts increased depression in a mixed clinical and community sample. Similarly, few longitudinal studies have investigated the prospective relationship between interpersonal risk factors and depression, after controlling for baseline depression and other interpersonal risk factors. Moreover, there has been little empirical investigation of whether rumination and interpersonal factors jointly predict future depression (with Spasojević & Alloy, 2001, an exception). At the point of writing, no previous study has evaluated whether brooding and key depressogenic interpersonal mechanisms, rejection sensitivity, and the submissive interpersonal style are primarily independent vulnerability factors each separately predicting future depressive symptoms, or whether the ability of either to predict subsequent depression is partially dependent on its shared variance with the other factor.

With regards to the hypothesised thesis model (Figure 5.1), the analyses presented in this chapter test the hypothesised links between rumination and depression (paths 7 and 8), between attachment orientation (rejection sensitivity) and depression (path 15) and between interpersonal style (submissive interpersonal style) and depression (path 17). See Figure 5.1.

Figure 5.1

Hypothesised Thesis Model: Study 3, Hypothesis 5



The main analyses reported in study 3 are a series of linear hierarchical regression models in which depressive symptoms, as assessed using the Beck Depression Inventory (BDI, Steer, & Brown, 1996), was the criterion variable. The BDI was selected as an index of depressive symptomatology because it has been widely used in the literature and is recognized as having good face validity and internal reliability (Richter, Werner, Heerlein, Kraus, & Sauer, 1998). In the current study, the BDI at Time 2 was positively skewed, resulting in an extreme outlier variable (i.e., with a standardized residual > 3). To address this issue, a log transformation was undertaken (using SPSS syntax to create a new transformed variable, as described in Tabachnick & Fidell, 2007, p. 89, section 5.8, Appendix A). In addition, to further validate the study 3 results, a supplementary analysis

was conducted, in which Time 2 diagnostic status (conceptualised as a dichotomous variable, meeting DSM-IV criteria for a current major depressive episode, yes/no) was the dependent variable (section 5.10, Appendix C).

The results presented in Chapter 5 were partially consistent with the stated hypotheses. As predicted, brooding (but not reflection) and the submissive interpersonal style independently predicted increased depressive symptoms six months later. However, contrary to the stated predictions, brooding did not mediate the effect of the submissive interpersonal style on depression. Instead, the effect of brooding on subsequent depression was reliant on its relationship with the submissive interpersonal style. This was an unexpected, but nonetheless interesting, finding, because it raises questions about whether one route through which brooding might fuel depression is via exacerbation of maladaptive submissive (overly-accommodating, non-assertive and self-sacrificing) interpersonal behaviours (an idea which is explored further in chapter 6, in which the longitudinal relationship between brooding, rejection sensitivity, and the submissive interpersonal style is examined). A similar pattern of results was obtained when brooding, rejection sensitivity, and the submissive interpersonal style predicted depression status at Time 2 (section 5.10, Appendix C). When brooding, rejection sensitivity, and the submissive interpersonal style were entered simultaneously into the logistic regression model, only the submissive interpersonal style was a significant predictor of Time 2 diagnostic status. Thus, it is this maladaptive submissive interpersonal style which emerged from the analyses as the most reliable predictor of future depression.

Submissive interpersonal style mediates the effect of brooding on future depressive symptoms

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5.2 Abstract

Theoretical models and empirical evidence suggest that brooding, the maladaptive sub-component of depressive rumination, is associated with a sub-set of depressogenic interpersonal difficulties characterised by submissive interpersonal behaviours and rejection sensitivity. This study tested whether these cognitive and interpersonal vulnerability factors independently predicted future depression and investigated their interdependence in predicting depression. A heterogeneous adult sample completed self-report measures assessing depressive symptoms, brooding, reflection, rejection sensitivity and maladaptive interpersonal behaviours, at baseline and six months later. When examined separately, brooding and an interpersonal component reflecting submissive, (overly-accommodating, non-assertive, and self-sacrificing) interpersonal behaviours each prospectively predicted increased depressive symptoms six months later, after controlling for baseline depressive symptoms and gender. When examined together, the submissive interpersonal style but not brooding predicted depression, indicating that this maladaptive interpersonal style may mediate the effect of brooding on future depression. Thus, the effects of brooding on depression may in part depend on its association with an interpersonal style characterised by submissiveness.

Keywords: rumination, brooding, depression, submissiveness, rejection sensitivity

5.3 Introduction

Depressive rumination has been defined as repetitively focusing on the symptoms of depression and their causes and meanings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Nolen-Hoeksema's (1991; 2004) response styles theory (RST) predicts that rumination contributes to the onset and maintenance of depression because it enhances the effect of negative mood on thinking, interferes with effective problem solving and instrumental behaviour, and results in an erosion of social support. Consistent with the RST, findings from a range of experimental and longitudinal studies have implicated depressive rumination in the onset and maintenance of depression (for reviews see Nolen-Hoeksema, et al., 2008; Watkins, 2008). Recent analyses of rumination have distinguished between distinct factors: a maladaptive factor labelled brooding, defined as 'a passive comparison of one's current situation with some unachieved standard' (p.256), and a more adaptive reflection factor, defined as actively attempting to gain insight into problems (Treyner, Gonzalez, & Nolen-Hoeksema, 2003).

Importantly, the brooding factor was found after the standard measure of rumination (Response Styles Questionnaire) was factor analysed after removing items which referred to depressive symptoms (Treyner, et al., 2003), that is, when a form of rumination less contaminated with depressive symptoms was assessed. Moreover, previous empirical studies indicate that brooding encapsulates the most harmful aspects of rumination (Treyner, et al., 2003, Burwell & Shirk, 2007). Thus, brooding, but not reflection has been found to prospectively predict depression in community adults (Treyner, et al., 2003), adolescents (Burwell & Shirk, 2007) and students (Olson & Kwon, 2008). However, to date, no previous study has investigated the prospective

relationship between brooding, reflection, and future depressive symptoms in a mixed clinical and community adult sample. Thus, the first aim of the current study was to test the prediction, derived from RST, that brooding, but not reflection, prospectively predicts increased depressive symptoms in a heterogeneous sample including currently depressed, previously depressed, and never depressed adults.

Similarly, there are theoretical models and empirical precedents which suggest that interpersonal factors confer vulnerability to depression. Different theories of depression predict that interpersonal behaviours and underlying interpersonal styles confer vulnerability to depression (e.g., Coyne, 1976a, 1976b; Joiner, 2000), with each theory emphasizing different components of interpersonal behaviour and stable features of interpersonal style. Several theories propose that more intrusive-needy interpersonal behaviours are associated with depression. For example, Coyne (1976a, 1976b) hypothesised that the tendency to excessively seek reassurance from close others, based on an underlying sense of worthlessness, and the negative response that this behaviour triggers in others, is a specific interpersonal factor which increases vulnerability to depression.

Attachment theory (Bowlby, 1958, 1969, 1973, 1980) provides another interpersonal account of depression which assumes that individuals who have had adverse childhood experiences of loss and/or rejection, resulting in the development of internalized models of others as unavailable or rejecting, have an increased susceptibility to depression because they are more likely to experience feelings of helplessness about their ability to make and maintain healthy adult relationships. More recently, Downey and Feldman (1996, p.1329) operationalized rejection sensitivity as ‘generalised

expectations and anxiety about whether significant others will meet one's needs for acceptance or will be rejecting'. Ayduk, Downey, and Kim (2001) argued that this rejection sensitivity is a vulnerability factor for depression.

Evolutionary (Gilbert, Allan, & Trent, 1995), interpersonal (Horowitz & Vitkus, 1986; Joiner, 2000) and behavioural (Ferster, 1973; Lewinsohn, 1974) theories have all emphasized the role of submissiveness, passivity, and avoidance in depression. Across all of these theories is the hypothesis that such avoidance behaviour prevents the resolution of practical and interpersonal problems, leads to the exacerbation of ongoing interpersonal conflicts, the loss of status and social support, and reduces contact with reward and positive reinforcement, all of which contribute to the maintenance of depression. Moreover, interpersonal avoidance itself becomes self-propagating through negative reinforcement: the relief of avoiding an anxiety-provoking interpersonal situation will further reinforce the avoidance.

Joiner (2000) proposed that interactions which occur between different maladaptive interpersonal processes, including both needy behaviours, such as excessive reassurance seeking, and submissive behaviours, such as conflict avoidance, contribute to explaining depression recurrence. Joiner emphasized the role of conflict avoidance (relative to generalised avoidance) in the maintenance of depression because (a) lack of assertiveness is characteristic of those vulnerable to depression (Ball, Otto, Pollack, & Rosenbaum 1994); (b) generalised avoidance is likely to be underpinned by conflict-related cognitions (e.g., fears that self-expression will lead to rejection or humiliation). Consistent with this theoretical approach, a number of prospective longitudinal studies have found that avoidance coping predicts subsequent depression (e.g., Ball et al., 1994;

Blalock & Joiner, 2000; Cronkite, Moos, Twohey, Cohen, & Swindle, 1998; Holahan, Moos, Holahan, Brennan, & Schutte, 2005).

To date, those studies which have investigated whether interpersonal factors prospectively predict depression have not incorporated a comprehensive range of interpersonal styles and behaviours. Thus, the second aim of the current study was to test the contrasting predictions made by different interpersonal theories regarding which interpersonal styles and behaviours prospectively predict depression, after controlling for baseline depressive symptoms, and the effect of other interpersonal styles at baseline. Given the centrality of passivity and conflict avoidance in theoretical accounts of depression, we hypothesised that a submissive interpersonal style will be the primary interpersonal predictor of depression, when controlling for other depressogenic interpersonal factors (needy interpersonal style and rejection sensitivity).

Since cognitive mechanisms and poor interpersonal functioning are both implicated in the aetiology of depression, it is theoretically plausible that they may be associated, leading to proposed integrations of cognitive and interpersonal models of depression (Joiner, 2000; Safran, 1990a, 1990b; Schmidt, Schmidt, & Young, 1999). Indeed, Joiner (2000, p.211) proposed that depressive rumination might be the ‘cognitive motor’ which fuels depressive interpersonal mechanisms. Moreover, there is a strong theoretical rationale for expecting brooding to be associated with passive and submissive behaviours. By theoretical definition, rumination is a passive coping strategy (Nolen-Hoeksema, 1991, 2004). Moreover, brooding has been conceptualised as a form of avoidance coping (Holahan, et al., 2005; Martell, Addis, & Jacobson, 2001; Nolen-Hoeksema, et al., 2008; Watkins, et al., 2007), is correlated with measures of avoidance

(Moulds, Kandris, Starr, & Wong, 2007), and contributes to reduced motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993). Thus, one would expect brooding to be associated with passive and submissive interpersonal behaviours.

Consistent with these hypotheses, depressive rumination is associated with submissiveness (Cheung, Gilbert, & Irons, 2004), reduced motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993) and poor interpersonal problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999). Moreover, cross-sectional analyses from the current study sample (at baseline) found that brooding, but not reflection, was specifically associated with a submissive interpersonal style incorporating overly-accommodating, non-assertive, and self-sacrificing behaviours ($p < .01$), even after controlling for depressive symptoms, gender and other interpersonal styles (needy and cold interpersonal styles, Pearson, Watkins, Mullan & Moberly, in revision, Chapter 4). Given the extensive theoretical rationale and empirical evidence implicating ruminative brooding in the development of depression, this relationship between rumination and a submissive interpersonal style is a further rationale for hypothesizing passive and avoidant responses to be a primary contributor to depression.

However, it is not known whether brooding and the submissive interpersonal style are primarily independent vulnerability factors, each separately predicting future depressive symptoms or whether the ability of either to predict subsequent depression is partially dependent on its shared variance with the other factor. Consistent with the latter possibility, there is empirical evidence which suggests that the relationship between interpersonal vulnerability factors and prospective depression depends on shared variance

with rumination (Spasojević & Alloy, 2001, Nolen-Hoeksema, Parker, & Larson, 1994, Saffrey & Ehrenberg, 2007). Thus, the third aim of the study was to test the hypothesis that brooding will mediate the effect of the submissive interpersonal style on future depressive symptoms.

In summary, based on both theoretical accounts and empirical precedent, we predicted that when examined in separate regression analyses:

- 1) Brooding will prospectively predict increased depressive symptoms six months later, controlling for baseline depressive symptoms, gender, and reflection.
- 2) The submissive interpersonal style will prospectively predict increased depressive symptoms six months later, after controlling for depressive symptoms, gender and the other depressogenic interpersonal factors (needy interpersonal style and rejection sensitivity).
- 3) Brooding will mediate the effect of the submissive interpersonal style on depressive symptoms six months later, controlling for depressive symptoms and gender.

5.4 Method

5.4.1 Participants

At baseline (Time 1), participants ($N = 103$) were recruited from a primary care service for depression ($n = 25$) and from the wider community ($n = 78$). Participants were recruited via a poster campaign which invited currently depressed, previously depressed and never depressed individuals to take part in the study. The aim of this recruitment strategy was to maximize the variance of depressive symptoms, rumination, and social functioning impairment in the sample, and, thereby, enhance our ability to detect relationships between variables and to increase generalizability of the study results. Thus,

our intention was to examine the variables of interest as continuous variables across this mixed, heterogeneous sample (for further details, see Pearson, et al., in revision, which reported on the cross-sectional analysis at baseline of this sample, Chapter 4). Exclusion criteria included a history of bipolar disorder ($n = 2$ excluded), psychotic symptoms ($n = 1$ excluded), being unable to engage for physical or practical reasons and current suicidal ideation (no participants were excluded on the basis of these final two criteria). Of the baseline sample, 92 attended a follow-up interview 6 months later (Time 2) (female $n = 65$, male $n = 27$). Analyses revealed that those who did not continue to follow up were not significantly different from those who completed both sessions in relation to level of depressive symptoms, brooding, interpersonal difficulties, age or gender distribution (5.9 Appendix B).

5.4.2 Measures

Structured Clinical Interview for DSM-IV: Mood Disorders Module (SCID; First, Spitzer, Gibbon, & Williams, 1997). The SCID is a semi-structured diagnostic interview which is widely used in a clinical and research context to facilitate reliable DSM-IV diagnoses. There was a high level of inter-rater reliability for diagnoses of current depression ($\kappa = 1$) and past major depression ($\kappa = 1$) between the original interviewer and an independent rater blind to condition, based on 10 randomly selected participants.

Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996). The BDI is a well-validated 21-item self-report questionnaire which measures depressive symptom severity in the past two weeks. Participants rate their answers using a 0-3 scale with higher scores indicating greater depression severity (range 0-63). In this study, the BDI-II demonstrated high internal consistency (T1 $\alpha = .96$, T2 $\alpha = .96$).

Response Style Questionnaire (RSQ) – Ruminative Responses Scale - Brooding and Reflection sub-scales (Nolen Hoeksema, 1991; Treynor, et al. 2003). The RSQ is a self-report measure which includes a 22 item Ruminative Response Scale (RRS), assessing the tendency to ruminate in response to depressed mood. Participants are asked to rate how often (almost never, sometimes, often, almost always) they think and do different things when feeling down, sad or depressed, e.g., “Think ‘why can’t I get going?’”. Brooding was measured using five items from the RRS scale, e.g., “Think ‘why do I always react this way?’” ($\alpha = .85$). Reflection was measured using another five items from the RRS measure, e.g., “Analyse recent events to try and understand why you are depressed” ($\alpha = .86$).

The Inventory of Interpersonal Problems-64 (IIP-64; Alden, Wiggins, & Pincus, 1990). The IIP-64 is a self-report questionnaire measuring interpersonal difficulties, with eight subscales derived from the dimensions of affiliation (hostile/cold to friendly behaviour) and dominance (submissive to controlling behaviour): Domineering (e.g., “I try to control other people too much”); Intrusive/Needy (e.g., “I find it difficult to spend time alone”); Self-Sacrificing (e.g., “I put other people’s needs before my own too much”); Overly-accommodating (e.g., “I let other people take advantage of me too much”); Non-assertive (e.g., “I find it difficult to let other people know what I want”); Socially inhibited (e.g., “I am too afraid of other people”); Cold (e.g., “I keep other people at distance too much”); Vindictive (e.g., “I am too suspicious of other people”). All subscales demonstrated good internal consistency: Domineering ($\alpha = .69$); Intrusive-needy ($\alpha = .76$); Self-sacrificing ($\alpha = .84$); Overly-accommodating ($\alpha = .82$); Non-assertive ($\alpha = .88$); Socially inhibited ($\alpha = .88$); Cold ($\alpha = .86$); Vindictive ($\alpha = .81$).

Adult Rejection Sensitivity Questionnaire (ARSQ; Downey, Berenson, & Kang, 2006). The ARSQ consists of nine hypothetical situations involving interactions with partner, family, friends, and strangers, with the potential for rejection (e.g., “Lately, you’ve been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong”). Individuals rate the degree to which they are concerned about rejection and degree of anticipatory anxiety about rejection on two 6-point scales, with a composite rejection sensitivity score calculated by multiplying these ratings. The total rejection sensitivity score is the mean of these composite scores. The scale demonstrated good internal consistency ($\alpha = .86$).

Depressive Interpersonal Relationships Inventory – Excessive Reassurance Seeking Scale (DIRI-ERS; Joiner & Metalsky, 2001). The DIRI-ERS is a four-item subscale of the DIRI which measures frequency of engaging in excessive reassurance-seeking behaviours (e.g., “In general, do you find yourself often asking the people you feel close to how they truly feel about you?”) on a seven-point scale (1, no, not at all – 7, yes, very much). The scale had good internal consistency ($\alpha = .88$). We only administered the ERS scale and not the other subscales of the DIRI (general dependency, need for approval, doubting others sincerity) because (a) previous psychometric analyses have demonstrated the ERS to be a cohesive interpersonal factor with internal consistency, factorial rigor, discriminability and convergent validity (Joiner & Metalsky, 2001); (b) only ERS is implicated in the development of future depression; (c) ERS has been used as an independent measure of excessive reassurance seeking, setting a valid methodological precedent which the current study follows (e.g., Joiner & Schmidt, 1998, Katz, Beach, & Joiner, 1998, Potthoff, Holahan, & Joiner, 1995; Shaver, Schachner, &

Mikulincer, 2005); (d) to reduce participant burden.

5.4.3 Interpersonal components

Because of the multicollinearity between the psychosocial variables and the large number of potential factors to investigate, we calculated a Principal Components Analysis (direct oblimin oblique rotation) on the nine psychosocial variables which measured interpersonal behaviours in order to determine if there were common behavioural components (see Pearson, Watkins, & Mullan, in revision, Chapter 4, for more details). Tabachnick and Fidell (2007) recommend that this approach is adopted when the aim is to reduce a large number of variables down to smaller components. An oblique rotation is recommended when theory suggests that underlying constructs are correlated, as found above. Kaiser's criterion was applied, so that components with eigenvalues greater than one were retained.

Three interpersonal behaviour components were extracted, accounting for 80.71% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was .80 which indicated that the solution obtained produced distinct and reliable factors. Component 1, henceforward labelled "submissive interpersonal style", (eigenvalue = 3.27 after rotation) had three items with salient loadings (> .5): the IIP subscales concerned with overly-accommodating, non-assertive, and self-sacrificing behaviours. Component 2, henceforward labelled "needy interpersonal style", (eigenvalue = 2.85 after rotation), had three items with salient loadings (>.5): the IIP intrusive-needy and domineering subscales and excessive reassurance-seeking. Component 3, henceforward labelled "cold interpersonal style", (eigenvalue = 3.38 after rotation) had three items with salient loadings (> .5): IIP cold, vindictive and socially inhibited sub-scales. Component scores

were computed in SPSS using the regression method.

5.5 Procedure

Participants were interviewed by the researcher to assess baseline diagnostic status and then completed the battery of self-report questionnaires (Time 1). Six months later, participants were interviewed again to reassess diagnostic status and completed another set of the self-report measures (Time 2).

5.6 Results

5.6.1 Data analysis

A series of hierarchical regression analyses were conducted to (1) evaluate the contribution of brooding as a predictor of Time 2 depressive symptoms, (2) to evaluate the contribution of the submissive interpersonal styles as a predictor of Time 2 depressive symptoms, and (3) to assess whether brooding mediated the effect of the submissive interpersonal style on prospective depressive symptoms. We adhered to the process for testing mediation outlined by Baron and Kenny (1986). SPSS diagnostics were examined to ensure that the hierarchical regression models were not biased due to multi-collinearity or the influence of outliers and residuals. Due to one outlier with a standardized residual $> .3$, the BDI was log transformed (Section 5.8, Appendix A). SPSS diagnostics using the BDI log transformed variable indicated that all VIF < 10 , all tolerance statistic $> .2$, there were no standardized residuals with an absolute value $> .3$ and the assumption of independent errors was met (Durbin Watson = 1.77- 2.15).

5.6.2 Preliminary analyses

Table 5.1 presents the correlations between the key variables. Brooding,

reflection, rejection sensitivity and the needy interpersonal styles were all significantly positively correlated with Time 2 depressive symptoms (BDI). The submissive interpersonal style was significantly negatively correlated with Time 2 BDI (due to reverse coding of the submissive interpersonal style component, the negative correlation indicated that higher levels of submissiveness, as denoted by a lower score, were associated with increased depressive symptoms and increased rumination). Although time 1 cold interpersonal style was also correlated with Time 2 depressive symptoms ($R = .44$, $p < .001$) this variable was not included in the main analyses due to the lack of a clear theoretical rationale which indicates that the cold interpersonal style confers risk to depression. However, the results were replicated including the cold interpersonal style as an additional control variable and a similar pattern of results was obtained¹.

Table 5.1

Inter-correlations between Depression, Brooding, Reflection and Interpersonal Variables

	1	2	3	4	5	6	7	8
1. T1 BDI	-	.66**	-.06	.73**	.56**	.58**	-.41***	.50***
2. T2 BDI		-	.07	.57***	.28**	.42***	-.50***	.37***
3. Gender			-	.03	.05	.05	.21*	.07
4. T1 Brooding				-	.72***	.57***	-.47***	.47***
5. T1 Reflection					-	.47***	-.24*	.39***
6. T1 ARSQ						-	-.59***	.45***
7. T1 Submissive							-	-.27**
8. T1 Needy								-

Note. $N = 90 - 101$ due to missing data. T1 BDI = Time 1 Beck Depression Inventory-II, T2 BDI = Time 2 Beck Depression Inventory-II, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS, ARSQ = Adult Rejection Sensitivity Questionnaire, Submissive = submissive interpersonal style (interpersonal component), Needy = needy interpersonal style (interpersonal component) * $p < .05$, ** $p < .01$, *** $p < .001$

5.6.3 Does T1 brooding predict T2 depressive symptoms?

To test the first hypothesis that brooding (but not reflection) would prospectively predict increased depressive symptoms, we conducted a hierarchical regression model in which Time 2 depressive symptoms (BDI) was the criterion variable (Table 5.2). Time 1 BDI was entered at step 1 and gender was entered at step 2 as a control variable in the regression equation. Brooding and reflection were entered simultaneously at step 3. At step 1, Time 1 BDI was a significant predictor of Time 2 BDI, $\beta = .70$, $t(88) = 9.52$, $p < .001$. Time 1 BDI explained 50.7% variance in Time 2 BDI, $F(1, 88) = 90.61$, $p < .001$. Adding gender at step 2 did not significantly improve the hierarchical regression model, $\Delta R^2 = .02$, $p = .06$ although the overall model was statistically significant, $F(2, 87) = 48.64$, $p < .001$. Adding Time 1 brooding and Time 1 reflection at step 3 did not significantly improve the model, $\Delta R^2 = .03$, $p = .06$, although the overall model remained statistically significant, $F(4, 85) = 26.77$, $p < .001$. Time 1 brooding was a significant

predictor of Time 2 depressive symptoms, $\beta = .03$, $t(85) = 2.38$, $p < .01$. Time 1 reflection was not a significant predictor of Time 2 depressive symptoms, $\beta = -.02$, $t(85) = -1.34$, $p = .18$.

Table 5.2

Summary of Hierarchical Regression Analysis testing whether Brooding and Reflection at Time 1 Predict Time 2 Depression

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 BDI	.70	9.52***	.50		88
Step 2	T1 BDI	.71	9.79***	.52	.02	87
	Gender	.16	1.95			
Step 3	T1 BDI	.61	6.58***	.54	.01	85
	Gender	.15	1.82			
	T1 Brooding	.03	2.38*			
	T1 Reflection	-.02	-1.34			

Note. T1 BDI = Time 1 Beck Depression Inventory-II, T2 BDI = Time 2 Beck Depression Inventory-II, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS. * $p < .05$, ** $p < .01$, *** $p < .001$

5.6.4 Does the submissive interpersonal style predict T2 depressive symptoms?

To test the second hypothesis that the submissive interpersonal style would prospectively predict increased depressive symptoms at Time 2, we conducted another hierarchical regression model with Time 2 BDI as the criterion variable (Table 5.3), and in which the first two steps replicated those specified for the previous model. In this second hierarchical regression model, the submissive and needy interpersonal styles and rejection sensitivity were entered simultaneously at step 3 (i.e., enabling us to test which of all the depressogenic interpersonal elements best predict depression when controlling for each other). Adding the three interpersonal variables significantly improved the

model, $\Delta R^2 = .07$, $p < .01$, and the overall model was statistically significant, $F(5, 73) = 19.36$, $p < .001$. Only the submissive interpersonal style was a statistically significant predictor of Time 2 BDI, $\beta = -.17$, $t(73) = -3.06$, $p < .01$. Neither rejection sensitivity nor the needy interpersonal style were statistically significant predictors of T2 BDI (rejection sensitivity, $\beta = -.02$, $t(73) = -1.64$, $p = .11$, needy interpersonal style, $\beta = .09$, $t(73) = 1.81$, $p = .07$, when controlling for T1 BDI, gender, and the other interpersonal components.

Table 5.3

Summary of Hierarchical Regression Analyses testing whether Depressogenic Interpersonal Variables at Time 1 Predict Time 2 Depression

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 BDI	.69	8.33***	.47	-	72
Step 2	T1 BDI	.70	8.54***	.48	.02	70
	Gender	.17	1.81			
Step 3	T1 BDI	.55	5.38***	.54	.07**	67
	Gender	.22	2.39*			
	T1 ARSQ	-.02	-1.64			
	T1 Submissive	-.17	-3.06**			
	T1 Needy	.09	1.81			

Note. T1 BDI = Time 1 Beck Depression Inventory-II, T2 BDI = Time 2 Beck Depression Inventory-II, ARSQ = Adult Rejection Sensitivity Questionnaire, T1 Submissive = Time 1 submissive interpersonal style (interpersonal component), T1 Needy = Time 1 needy interpersonal style (interpersonal component) * $p < .05$, ** $p < .01$, *** $p < .001$

5.6.5 Does T1 brooding mediate the effect of T1 submissive interpersonal style on Time 2 depressive symptoms?

Consistent with Baron and Kenny's (1986) first criteria for mediation, the Time 1

submissive interpersonal style (the independent variable in the hypothesised mediation model) was significantly correlated with Time 1 brooding (the proposed mediator) after controlling for depressive symptoms, gender and other interpersonal styles, $\beta = -.92$, $t(92) = -2.85$, $p < .01$ (section 4.5.4). The second condition for mediation requires that the submissive interpersonal style (independent variable) prospectively predicts the criterion variable, Time 2 depressive symptoms (as shown in Table 5.3). The third condition for mediation requires that brooding (the hypothesised mediator) prospectively predicts the criterion variable, Time 2 depressive symptoms (as shown in Table 5.2). Finally, to establish mediation, we conducted a further hierarchical regression model in which Time 2 depressive symptoms was the criterion variable and with steps 1 and 2 replicating the previous models specified (Table 5.4). At step 3, brooding and the submissive interpersonal style were entered simultaneously². To satisfy our mediational hypothesis, the effect of the overly-accommodating-non-assertive style (the independent variable) on Time 2 depressive symptoms should be less in this final hierarchical regression model, with the putative mediator, brooding, added. However, contrary to our predictions, the relationship between Time 1 brooding and Time 2 depressive symptoms was no longer significant, whereas the relationship between the Time 1 submissive interpersonal style and Time 2 depressive symptoms remained significant, which indicated that the submissive interpersonal style may mediate the effect of brooding on subsequent depression. To directly test this hypothesis, we used Preacher and Hayes' SPSS macro (with 5,000 re-samples), which found that the true indirect effect of Time 1 brooding on Time 2 depression through shared variance with the overly-accommodating-non-assertive interpersonal was estimated to lie between .001 and .128 with 95% confidence. Because 0

was not within the 95% confidence interval, these findings suggest that the indirect effect of brooding on depression through the submissive interpersonal style was significantly different from 0, at $p < .05$, and indicated that the maladaptive interpersonal style mediated the relationship between brooding and depression³.

Table 5.4

Summary of Hierarchical Regression Analyses testing whether Brooding and the Submissive Interpersonal Style Predict Time 2 Depression

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 BDI	.69	9.16***	.49	-	85
Step 2	T1 BDI	.70	9.41***	.50	.02	84
	Gender	.15	1.79			
Step 3	T1 BDI	.53	5.47***	.54	.05*	82
	Gender	.17	2.01			
	T1 Submissive	-.10	-2.11*			
	T1 Brooding	.02	1.23			

Note. T1 BDI = Time 1 Beck Depression Inventory-II, T2 BDI = Time 2 Beck Depression Inventory-II, T1 Submissive = Time 1 submissive interpersonal style (interpersonal component), T1 Brooding = Time 1 Brooding sub-scale of the RRS, * $p < .05$, ** $p < .01$, *** $p < .001$

5.7 Discussion

As predicted, and replicating previous findings (Burwell & Shirk, 2007; Treynor, et al., 2003), the brooding sub-component of depressive rumination, but not the reflection sub-component, prospectively predicted increased depressive symptoms six months later, after controlling for baseline depressive symptoms and gender. These findings further confirm that brooding predicts subsequent depression, consistent with the hypothesis that rumination is a vulnerability factor for depression. Moreover, the findings

support the conceptualisation of rumination as a multidimensional construct, with brooding as the more maladaptive subtype of ruminative self-focus relative to reflection.

Moreover, consistent with our second hypothesis and aligned with previous findings which have indicated that interpersonal factors confer vulnerability to depression, the submissive interpersonal style, incorporating passive, overly-accommodating, non-assertive and self-sacrificing behaviours, significantly predicted depression six months later, after controlling for baseline depression and demographic variables. Interestingly, although the depressogenic interpersonal variables (submissive, needy and cold interpersonal styles and rejection sensitivity) were all statistically significantly correlated with depressive symptoms cross-sectionally, only the submissive interpersonal style significantly predicted subsequent depression, after controlling for baseline depression and the other interpersonal styles. Thus, it appears that a specific subset of interpersonal difficulties, characterised by overly-accommodating, non-assertive and self-sacrificing behaviours is implicated in vulnerability for increasing depression.

The association between non-assertive, self-sacrificing, and overly-accommodating behaviours and future depressive symptoms is consistent with the literature surrounding submissive and passive behaviour and psychopathology (Allan & Gilbert, 1997). In their review, Allan and Gilbert (1997) argued that subordinate and submissive behaviour is central to the aetiology of depression. Likewise, behavioural models of depression emphasize the role that escape and avoidance plays in the onset and maintenance of depression, by reducing contact with reward and by preventing resolution of problems (Ferster, 1973). Consistent with these theories, there is an accumulating

evidence base that passive and avoidant responses predict depression (e.g., Ball, et al., 1994; Blalock & Joiner, 2000; Cronkite, et al., 1998; Holahan, et al., 2005), to which the current study adds an interpersonal extension. The current findings provide further evidence consistent with these theories that hypothesize that passive, avoidant coping is a central causal factor in depression. Similarly, both cognitive (Beck, 1983), interpersonal (Bowlby, 1980; Coyne, 1976a, 1976b; Joiner, 2000) and psychodynamic (Blatt & Zuroff, 1992) models of depression assume that excessive needs for relatedness (another dimension of the submissive component) are vulnerability factors for depression. Thus, the findings are broadly consistent with existing knowledge about interpersonal vulnerability factors for depression.

Contrary to our predicted hypothesis, we did not find that brooding mediated the effects of the submissive interpersonal style on subsequent depression. In contrast, we found that the significant relationship between brooding and subsequent depressive symptoms seemed to be based on the shared variance of brooding with the submissive interpersonal style, i.e., that the interpersonal style mediated the effect of brooding on subsequent depression. To the best of our knowledge, this is the first prospective study which used a mixed clinical and community sample and jointly examined the effects of brooding and an associated interpersonal style in predicting subsequent depressive symptoms. Importantly, it revealed that the effects of brooding on subsequent depression may be dependent on its association with the submissive pattern of interpersonal behaviour.

The current findings suggest that since high brooders tend to be overly accommodating, non-assertive, and self-sacrificing that they are more likely to maintain

or to increase their symptoms of depression over time because this passive interpersonal style is a direct risk factor for depression. Thus, this finding raises the possibility that a third variable (interpersonal style) may be responsible for previous findings of rumination (incorporating the brooding factor) predicting depression, especially since this potential third variable was not assessed in the majority of studies examining rumination as a risk factor. Whilst this is only one report of this relationship, and therefore requires further replication, it is an important finding because it suggests a potential mechanism by which ruminative brooding influences risk for depression, via associated passive interpersonal behaviours. Moreover, this finding suggests that it may not be the cognitive consequences of rumination, but rather correlated interpersonal behaviours that best predict subsequent depression. Moreover, this pattern of findings further confirms that brooding can be usefully conceptualised as a passive response style, and that some of its negative consequences may result from associated passive and submissive behaviours (Holahan, et al., 2005; Martell, et al., 2001; Nolen-Hoeksema, et al., 2008; Watkins, et al., 2007).

Interestingly, our findings did not replicate those of other studies which have shown that depressive rumination mediates the effect of interpersonal vulnerability factors on depression (Nolen-Hoeksema, et al., 1999; Saffrey & Ehrenberg, 2007; Spasojević & Alloy, 2001). One reason for this discrepancy could be that these other studies did not incorporate specific maladaptive interpersonal behaviours in addition to more stable features of interpersonal style. For example, Spasojević and Alloy (2001) found that rumination mediated the effect on depression of neediness, assessed using the Depressive Experiences Questionnaire (Blatt, D’Afflitti, & Quinlan, 1976; Rude & Burnham, 1995). In contrast to the Inventory of Interpersonal Problems (Alden, et al.,

1990), which measures specific interpersonal behaviours (e.g., ‘it is hard for me to confront people with problems that come up’), the DEQ comprises ‘statements concerning personal characteristics and traits’ (e.g., ‘anger frightens me’). Thus, rumination might be more proximal to depression than stable underlying beliefs and expectations about relationships, but less proximal to depression than resultant maladaptive interpersonal behaviours. Another reason for this discrepancy might be differences in sample composition: in contrast to the current study sample, in which nearly two-thirds were either currently depressed or had a past history of major depression, most of these other studies used student samples, limiting the extent to which their findings can be generalised to a clinical population. It is plausible that depressogenic cognitive and interpersonal mechanisms interact differently in non-clinical dysphoric individuals, compared to those meeting diagnostic criteria for major depressive disorder.

The principal limitation of the study design is that inferences about the causal relationship between brooding and the submissive interpersonal style cannot be drawn because brooding and the interpersonal variables were all assessed at the same time-point and there was no manipulation of the study independent variables. Additional limitations include a relatively small sample size, potentially limiting statistical power to detect interactional relationships between variables, and reliance on self-report measures with the potential for measurement inaccuracy and/or biased responses. Future research should be undertaken incorporating multiple time-points, observational and ‘real-time’ measures, and larger samples, to facilitate gaining a more detailed understanding of the relationship between rumination and interpersonal vulnerability factors for depression.

The current findings are consistent with existing empirical evidence which

indicates that interventions which directly target interpersonal difficulties and maladaptive interpersonal behaviours (e.g., interpersonal therapy, Weissman, Markowitz, & Klerman, 2000 and behavioural interventions, Lewinsohn, 1974) can be an efficacious treatment for depression. Moreover, the findings suggest that interpersonal interventions, and particularly those that reduce passive, non-assertive behaviours, might be an effective alternative to cognitive-behaviour therapy for those depression-vulnerable individuals who are susceptible to brooding. Further research involving the manipulation of brooding and maladaptive interpersonal behaviour, via experimental means and clinical intervention, is required to more fully investigate the causal nature of relationship between brooding and interpersonal style and the potential clinical utility of the current study findings.

In conclusion, the current study provides further empirical evidence which is consistent with the hypothesis that brooding is a particularly maladaptive sub-component of rumination. Moreover, the current study is the first to demonstrate that the effect of brooding on future depressive symptoms is mediated by a specific maladaptive interpersonal style incorporating overly-accommodating, non-assertive and self-sacrificing interpersonal behaviours.

Footnotes

¹ Equivalent analyses were calculated including the cold interpersonal style (this interpersonal component was not included in the main analyses due to the lack of a clear theoretical rationale which indicates that the cold interpersonal style confers risk to depression). After controlling for Time 1 depressive symptoms and gender, adding the three interpersonal components and rejection sensitivity significantly improved the model, $\Delta R^2 = .09, p < .01$, and the overall model was statistically significant, $F(6, 72) = 17.13, p < .01$. Only the submissive interpersonal style was a statistically significant predictor of Time 2 BDI, $\beta = -.17, t(72) = -3.19, p < .01$. Neither rejection sensitivity nor the cold or needy interpersonal styles were statistically significant predictors of Time 2 BDI (rejection sensitivity, $\beta = -.02, t(72) = -1.94, p = .06$, cold interpersonal style, $\beta = .10, t(72) = 1.78, p = .08$, needy interpersonal style, $\beta = .09, t(72) = 1.92, p = .06$), when controlling for T1 BDI and the other interpersonal components.

² Equivalent analyses were run with the full rumination scale in place of the brooding subscale. An equivalent pattern of results was obtained; the Rumination variable was no longer a statistically significant predictor of Time 2 depressive symptoms when entered simultaneously with the submissive interpersonal style, $\beta = .003, t(82) = .99, p = .32$. Using Preacher and Hayes' SPSS macro (with 5,000 re-samples), the true indirect effect of the submissive interpersonal style was estimated to lie between .001 and .031 with 95% confidence. Because 0 is not within the 95% confidence interval the findings suggest that the indirect effect through the submissive interpersonal style was not statistically significantly different from 0, and indicated that the maladaptive

interpersonal style mediated the relationship between brooding and depression.

³We tested an alternative model in which Time 1 brooding was specified as being the mediating variable (using the SPSS macro provided by Preacher and Hayes, 2004).

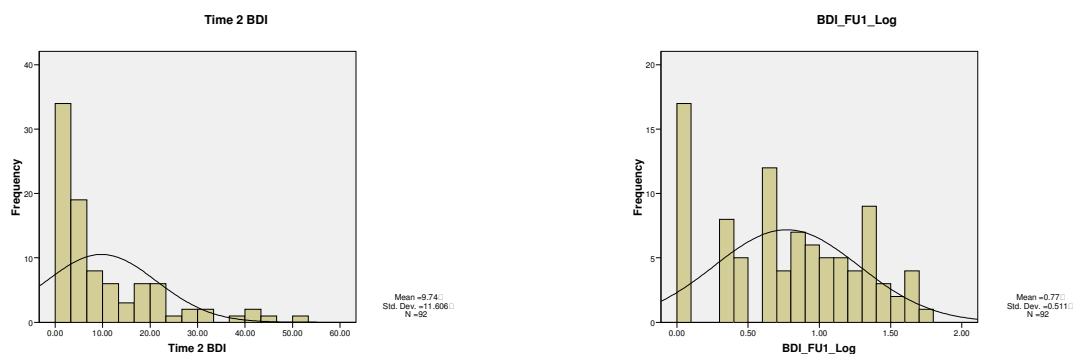
Results indicated that the true indirect effect of the Time 1 overly-accommodating component on Time 2 depression through shared variance with brooding was estimated to lie between $-.08$ and $.01$ with 95% confidence. Because 0 was within the 95% confidence interval, these findings suggest that the indirect effect of the overly-accommodating-non-assertive interpersonal style on depression was not significantly different from 0.

5.8 Appendix A: Time 2 BDI transformation

Although it is not a requirement for hierarchical regression analyses that variables are normally distributed (Tabachnick & Fidell, 2007), skewed data can be problematic when this results in cases with large residuals (> 3). Therefore, because it was detected in the preliminary hierarchical regression model that there was one outlier (i.e., case which generated a standardized residual > 3) and because the FU1 BDI data was significantly positively skewed ($z_{\text{skewness}} = 6.62, p < .001, z_{\text{kurtosis}} = 4.89, p < .001$), a log transformation was undertaken which addressed this issue. The log transformed data was not significantly skewed, although the distribution was slightly platykurtic ($z_{\text{skewness}} = -.038, p = \text{n.s.}, z_{\text{kurtosis}} = -2.10, p < .05$, Figure 5.2).

Figure 5.2

Distribution of the Time 2 BDI Variable Before and After (Log) Transformation



5.9 Appendix B: Comparison of study completers and non-completers

A small number of the original sample did not complete the follow-up assessment ($n = 11$). The majority of those who continued to follow-up (88%, $n = 81$) did not meet diagnostic criteria for a current major depressive episode at Time 2. As detailed below (Table 5.6), analyses, which compared those who completed only the first assessment with those who completed both assessments, revealed that there were no significant differences between the two groups in relation to depressive symptoms, brooding, interpersonal difficulties, age or gender distribution.

Table 5.5

Study Completers Versus Non-Completers Comparison

Measure	Completers	Non-completers	Difference
T1 BDI (SD)	14.36 (13.09)	26.27 (22.67)	$F(99) = 1.21$
T1 Brood (SD)	10.85 (4.14)	12.27 (5.42)	$F(90) = 1.09$
IIP Total (SD)	80.62 (39.65)	90.30 (49.50)	$F(101) = .55$
Age (SD)	45.71 (16.14)	46.55 (16.64)	$F(101) = .03$
Female (%)	65 (71%)	7 (64%)	$\chi^2 = .23(1)$

Notes: BDI = Beck Depression Inventory, Brood = Brooding sub-scale of the RRS, IIP total = Total interpersonal difficulties assessed using the Inventory of Interpersonal Problems. There was one cell with an expected value < 5 in the chi-square analysis.

5.10 Appendix C: Rumination and submissive interpersonal style predict diagnostic status

A supplementary analysis (logistic regression model) was undertaken to assess whether brooding, the submissive interpersonal style, and rejection sensitivity predicted diagnostic status (currently depressed or not currently depressed) six months later (controlling for Time 1 depression status and gender). A logistic regression model was computed with Time 2 depression status (currently depressed or not currently depressed) as the dependent variable, Time 1 depression status, gender, the submissive interpersonal style, rejection sensitivity and brooding were predictor variables. The full model was significantly reliable (chi-square = 23.79, (5), $p < .001$). The model accounted for between 26% and 51% of the variance in Time 2 depression status, with 99% ($n = 70$) of those not depressed at Time 2 ($n = 71$) successfully predicted. However, only 56% ($n = 4$) of those who were depressed at Time 2 ($n = 9$) were accurately predicted. Table 5.6 gives the coefficients and the Wald statistic and associated degrees of freedom and probability values for each of the predictor variables. This shows that baseline depression status and the submissive interpersonal style reliably predicted Time 2 diagnostic status. The values of the coefficients reveal that those who were depressed at Time 1 were more likely to be depressed at Time 2 (by a factor of 13.14), and that higher scores on the submissiveness component (indicative of a reduced level of submissiveness related difficulties due to reverse coding) were associated with decreased odds of meeting diagnostic criteria for being currently depressed at Time 2 (by a factor of .12).

Table 5.6

Summary of Logistic Regression Analysis testing whether Interpersonal Factors and Brooding at Time 1 Predict Time 2 Diagnostic Status

Predictor	<i>B</i>	<i>Wald</i>	Exp(B)	Chi square	df
Time 1 MDE	2.58	5.58	13.14*	23.79***	5
Gender	-.77	.63	2.16		
Brood	.10	.39	1.10		
ARSQ	-.09	.77	.91		
Submissive	-2.11	4.89	.12*		

Note. MDE = Major Depressive Episode (0 = not depressed at Time 1, 1 = depressed at Time 1), Gender (0 = Female, 1 = Male) Brood = Brooding sub-scale of the RRS, ARSQ = Adult Rejection Sensitivity Questionnaire, Submissive = Submissive interpersonal style (IIP component)

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

CHAPTER 6: The prospective relationship between rumination, rejection sensitivity and submissive interpersonal style

6.1 Preface

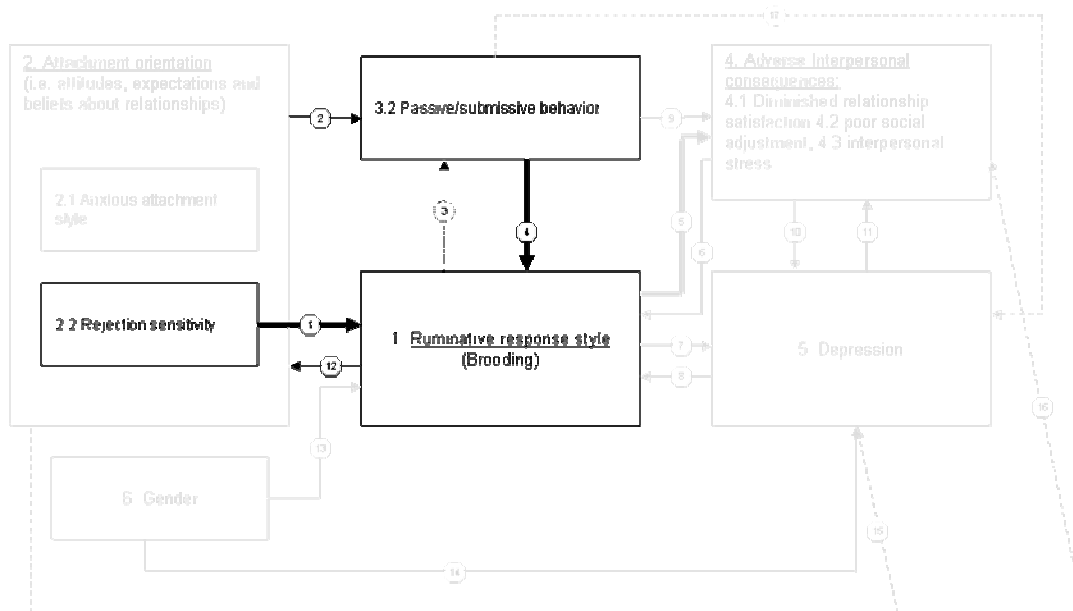
Having examined the concurrent relationship between rumination and interpersonal style (Chapter 4, study 2), and the prospective relationship between rumination and depressogenic interpersonal factors predicting future depressive symptoms (Chapter 5, study 3), the current chapter reports a study which investigated the longitudinal relationship between rumination and the interpersonal variables with which it was associated concurrently in Chapter 4 (submissive interpersonal style and rejection sensitivity). The main body of the chapter consists of a paper, reporting this study, which has been submitted to Behaviour Research and Therapy (currently under review). As discussed in the introduction, demonstrating this longitudinal relationship represents a necessary, but not sufficient step towards delineating the causal nature of relationship between rumination, the submissive interpersonal style, and rejection sensitivity.

Whilst there is a compelling theoretical rationale underpinning the dual hypotheses that rumination has adverse interpersonal consequences (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004) and that interpersonal factors confer vulnerability to rumination (Nolen-Hoeksema & Jackson, 2001; Saffrey & Ehrenberg, 2007), few studies have yet to test these proposed theoretical models empirically. Indeed, the study presented in this chapter is the first to investigate the longitudinal relationship between rumination and the submissive interpersonal style, and to assess the prospective relationship between rumination and rejection sensitivity. This chapter addresses the third thesis hypothesis, that rumination fuels specific maladaptive interpersonal behaviours,

and hypothesis 4, that interpersonal factors predict rumination. The findings reported in this chapter extend understanding of the interpersonal context of rumination by examining the validity of theoretical accounts which indicate that rumination is associated with a sub-set of interpersonal difficulties characterised by excessive relationship concerns (Nolen-Hoeksema & Jackson, 2001), rejection sensitivity (Saffrey & Ehrenberg, 2007) and submissiveness (Cheung, Gilbert, & Irons, 2004) and which suggest that this relationship is likely to be bi-directional in nature. With regards to the hypothesised thesis model, the analyses presented in this chapter test the proposed link between a specific underlying attachment orientation (rejection sensitivity) and rumination (paths 1 and 12), and the proposed paths between the submissive interpersonal style and rumination (paths 3 and 4). See Figure 6.1.

Figure 6.1

Hypothesised Thesis Model: Study 4, Hypothesis 3



Hierarchical regression models were calculated in which Time 2 rumination (brooding and reflection) was the criterion variable and the Time 1 measures of rejection sensitivity and submissive interpersonal style were predictor variables, whilst statistically controlling for Time 1 rumination, Time 1 depression and gender. To test paths 3 and 12 (Hypothesis 3, time 1 rumination predicts time 2 interpersonal factors) further hierarchical regression models were conducted in which Time 2 rejection sensitivity and submissiveness were criterion variables respectively, with Time 1 rumination as the main predictor variable (controlling for Time 1 interpersonal factor, depression and gender). In this hierarchical regression model, Time 1 rejection sensitivity was the predictor variable and Time 2 submissive interpersonal style was the criterion variable (path 2).

A supplementary analysis was undertaken to test the prediction that rejection sensitivity predicts increased submissive interpersonal behaviours (path 2). This hypothesised link between rejection sensitivity and submissive interpersonal behaviours was underpinned by the theoretical assumption that individuals who are highly sensitive to rejection will be more likely, than those less sensitive to rejection, to submit to the wishes of others, to suppress their own needs, and to compromise personal goals in order to maintain relationships and avoid rejection (Ayduk & Gyurak, 2008; Purdie & Downey, 2000). Consistent with this hypothesis, rejection sensitivity was associated with an increased tendency for adolescent girls to do things that they know are wrong in order to maintain a romantic relationship (Purdie & Downey, 2000). However, to date, the longitudinal relationship between rejection sensitivity and submissiveness has not been tested in an adult sample.

The results discussed in this chapter provide some support for the proposed thesis model, because rejection sensitivity at baseline prospectively predicted increased rumination at Time 2 (path 1). This interesting result is discussed with reference to a control theory account of rumination, and it is proposed that individuals who are highly sensitive to rejection are more likely to perceive that the highly valued personal goals of avoiding rejection and maintaining relationships are not being met, thereby generating the unresolved goal discrepancies that drive rumination (Martin & Tesser, 1996). The other hypothesised relationships were not supported by the data: rumination did not prospectively predict increased rejection sensitivity (path 12) or increased submissive interpersonal behaviour (path 3) and rejection sensitivity did not predict increased submissive interpersonal behaviour (path 2).

Rejection sensitivity prospectively predicts increased rumination

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6.2 Abstract

Converging research findings indicate that rumination is correlated with a submissive interpersonal style, and an attachment orientation characterised by rejection sensitivity. This study further examined the prospective longitudinal relationship between rumination, the submissive interpersonal style, and rejection sensitivity by comparing two alternative hypotheses: (a) the submissive interpersonal style and rejection sensitivity prospectively predict increased rumination; (b) rumination prospectively predicts the submissive interpersonal style and rejection sensitivity. Currently depressed ($n = 22$), previously depressed ($n = 42$) and never depressed ($n = 28$) individuals completed self-report measures assessing depressive rumination and key psychosocial measures of interpersonal style and behaviours, at baseline and again six months later. Baseline rejection sensitivity prospectively predicted increased rumination six months later, after statistically controlling for baseline rumination, gender and depression. Baseline rumination did not predict the submissive interpersonal style or rejection sensitivity. The results provide a first step towards delineating a potential casual relationship between rejection sensitivity and rumination, and suggest the potential value of clinical assessment and intervention for both rejection sensitivity and rumination in individuals who present with either difficulty.

Keywords: rumination, depression, interpersonal style, submissive, rejection sensitivity

6.3 Introduction

Depressive rumination has been defined as repetitively focusing on the symptoms of distress and their causes and meanings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Findings from a range of experimental and longitudinal studies have implicated depressive rumination in the onset and maintenance of depression (for reviews see Nolen-Hoeksema, et al., 2008; Watkins, 2008). Recent analyses of rumination have distinguished between distinct factors: a maladaptive factor labelled brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’ (p.256), which prospectively predicted increase in depressive symptoms, and a more adaptive reflection factor, defined as actively attempting to gain insight into problems, which did not predict prospective depression (Treynor, Gonzalez, & Nolen-Hoeksema, 2003).

Similarly, there is evidence that interpersonal factors confer vulnerability to depression. Psychosocial factors implicated in the aetiology of depression include relatively stable features of interpersonal style such as insecure attachment patterns characterised by fear of rejection, e.g., anxious attachment style (Carnelley, Pietromonaco, & Jaffe, 1994) and rejection sensitivity, defined as the tendency to “anxiously expect, readily perceive, and overreact to rejection” (Downey & Feldman, 1996, p.132), and specific maladaptive interpersonal behaviours such as excessive reassurance-seeking (Davila, 2001; Joiner & Metalsky, 2001; Joiner & Schmidt, 1998) and submissiveness (Allan & Gilbert, 1997; Ball, Otto, Pollack, & Rosenbaum, 1994; Cheung, Gilbert, & Irons, 2004; Irons & Gilbert, 2005), and impaired social functioning (Ormel, Oldehinkel, Nolen, & Vollebergh, 2004).

Given that both cognitive mechanisms, such as rumination, and interpersonal

behaviours are implicated in the aetiology of depression, it is theoretically plausible that they may be associated, leading to proposed integrations of cognitive and interpersonal models of depression (Joiner, 2000; Schmidt, Schmidt, & Young, 1999). Indeed, Joiner (2000, p.211) proposed that depressive rumination might be the 'cognitive motor' which fuels depressive interpersonal mechanisms. Consistent with this hypothesis, rumination was significantly correlated with a range of maladaptive interpersonal behaviours in depressed patients (Lam, Schuck, Smith, Farmer, & Checkley, 2003) and positively associated with diminished relationship satisfaction in remitted depressed patients (Kuehner & Bueger, 2005).

More specifically, converging evidence suggests the hypothesis that depressive rumination is associated with a subset of interpersonal behaviours and concerns characterised by excessive relationship concerns (Gorski & Young, 2002; Nolen-Hoeksema, & Jackson, 2001; Spasojević & Alloy, 2001) and fear of rejection (Saffrey & Ehrenberg, 2007), passivity and avoidance (Lyubomirsky & Nolen-Hoeksema, 1993; Moulds, Kandris, Starr, & Wong, 2007) and submissiveness (Cheung, et al., 2004). Consistent with this hypothesis, a recent cross-sectional study found that depressive rumination was specifically associated with a submissive interpersonal style (incorporating overly-accommodating, non-assertive, and self-sacrificing behaviours), and rejection sensitivity, even after controlling for depressive symptoms, gender, and other interpersonal styles (Pearson, Watkins, Mullan, & Moberly, in press, Chapter 4).

These cross-sectional findings raise questions about the temporal and causal nature of relationship between depressive rumination and this maladaptive interpersonal style. Some research suggests a potential role of rejection sensitivity in exacerbating

rumination. First, Nolen-Hoeksema and Jackson (2001) proposed and found that people who are excessively concerned with maintaining close relationships will be susceptible to rumination in order to monitor how their relationships are going. Second, Saffrey and Ehrenberg (2007) proposed that individuals who are preoccupied by fears of rejection and abandonment would have more difficulty adjusting following the end of a relationship, thereby leading to increased rumination about the interpersonal loss. Consistent with this hypothesis, they found that following rejection, rumination was elevated in individuals with heightened fears of rejection and abandonment and associated with increased distress. Third, relative to those low in rejection-sensitivity, high rejection-sensitive individuals report greater feelings of rejection following the presentation of experimentally-manipulated ambiguous feedback (Downey & Feldman, 1996), show greater depression following a relationship break-up (Ayduk, Downey, & Kim, 2001), and show biases towards greater self-referential encoding and recall of rejection relevant material (Mor & Inbar, 2009). Since perceived rejection reflects an important unresolved goal of high personal relevance (i.e., to avoid rejection and to be in a secure relationship), and rumination is hypothesised to be activated in response to unresolved goals (Martin & Tesser, 1996; Watkins, 2008), rejection sensitivity may therefore increase vulnerability to rumination. Furthermore, increased recall and activation of negative material would lead to increased accessibility of negative memories of rejection, which may feed into repetitive and ruminative thought. Consistent with this possibility, rejection-sensitive people described ruminating in response to an ambiguous situation more than people low in rejection sensitivity (Downey & Feldman, 1996).

Similar accounts suggest the hypothesis that submissive, overly-accommodating,

non-assertive and self-sacrificing behaviours might contribute to increased rumination. First, being unassertive may lead to poorer interpersonal problem solving (Chiauzzi & Heimberg, 1986) and decreased social competence (Paulsen, Bru, & Murberg, 2006) and hence to the maintenance of unresolved interpersonal goals, driving further rumination. Moreover, if important personal concerns are silenced to accommodate others' needs but remain unresolved, it is likely that they will become the subject of further internal ruminations (O'Mahen, Flynn, & Nolen-Hoeksema, in press). Second, rumination is itself a manifestation of a passive response style (Nolen-Hoeksema, 1991, 2004) and, therefore, may become more frequent as a more passive style of responding is adopted, particularly in situations where people perceive they have little control over their environment. For example, Nolen-Hoeksema, Larson, and Grayson (1999, p.1062) argued that women ruminate more because 'they are searching for ways in which they can control their environment and their distress but do not feel efficacious about exerting that control and thus remain stuck in rumination'.

In contrast, Tse and Bond (2004) hypothesised that rumination fuels social functioning difficulties in depression by occupying cognitive resources necessary for social perception and interpersonal problem solving, and by activating negative cognitive schemata, negatively biasing how people interpret and respond to social stimuli. Consistent with this argument, experimental findings have indicated that rumination is causally implicated in increased negative thinking and impaired interpersonal problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999), and reduced motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993). These negative cognitive and motivational consequences of rumination would be

expected to generate passive and unassertive interpersonal behaviours, as well as contribute to increased perceptions of rejection. Consistent with this hypothesis, Nolen-Hoeksema (2004, p.112) argued that a greater tendency to ruminate can function to keep women 'stuck in cycles of passivity and impair their ability to overcome other problems contributing to their depression such as inequities in their marriages'.

Many of the studies reviewed are limited in using a cross-sectional design, leaving unresolved the temporal nature of relationship between rumination and interpersonal style, that is, whether these interpersonal responses are antecedents and/or consequences of depressive rumination (e.g., Nolen-Hoeksema & Jackson, 2001; Saffrey & Ehrenberg, 2007). Moreover, some of the studies utilized non-clinical samples (e.g., Saffrey & Ehrenberg, 2007, Spasojević & Alloy, 2001), making it unclear to what extent the findings can be generalised to an underlying clinical population.

Therefore the principal aim of this study was to investigate the temporal nature of the relationship between depressive rumination and elements of the associated maladaptive interpersonal style. By examining rumination, interpersonal style, social functioning and depression at baseline and six months later in a mixed sample of currently depressed, formerly depressed and never depressed adults, we tested two contrasting (but not mutually exclusive) hypotheses: (a) the submissive interpersonal style and elevated rejection sensitivity will prospectively predict increased rumination (brooding), controlling for baseline rumination, depression, and social functioning impairment; (b) Rumination (brooding) will prospectively predict increased submissiveness and rejection sensitivity six months later, controlling for the baseline interpersonal measures, depression and social functioning impairment. Given previous

findings indicating that brooding is the maladaptive subcomponent of rumination, we predicted that any prospective relationship between rumination and interpersonal behaviours would be evident for brooding but not for reflection.

6.4 Method

6.4.1 Participants

At baseline (Time 1), participants ($n = 103$) were recruited from a primary care service for depression ($n = 25$) and from the wider community ($n = 78$) (for further details, see Pearson et al., in revision, Chapter 4), which reported on the cross-sectional analysis at baseline of this sample). Participants were recruited from the wider community, via a poster campaign which invited currently depressed, previously depressed and never depressed individuals to take part in the study. The aim of this recruitment strategy was to maximize the variance of depressive symptoms, rumination, and social functioning impairment in the sample, and, thereby, enhance our ability to detect relationships between variables. Of the baseline sample, 92 attended a follow-up interview six months later (Time 2, female $n = 65$, male $n = 27$). The regression analyses reported were based on the sample of individuals who participated in both baseline and follow-up sessions. Analyses revealed that those who did not continue to follow up were not significantly different from those who completed both sessions in relation to level of depressive symptoms, brooding, interpersonal difficulties, age or gender distribution (5.9 Appendix B). Exclusion criteria included a history of bipolar disorder ($n = 2$ excluded), psychotic symptoms ($n = 1$ excluded), being unable to engage for physical or practical reasons and current suicidal ideation (no participants were excluded on the basis of these final two criteria).

6.4.2 Measures

Structured Clinical Interview for DSM-IV: Mood Disorders Module (SCID; First, Spitzer, Gibbon, & Williams, 1997). The SCID is a semi-structured diagnostic interview which is widely used in a clinical and research context to facilitate reliable DSM-IV diagnoses. The SCID Mood Disorders module was used to assess current depression status (i.e., to ascertain whether the individual met the DSM-IV criteria for a current major depressive episode at the baseline assessment), past history of depression (whether the individual had previously experienced one or more episodes of depression consistent with the DSM-IV criteria for a past major depressive episode) and current dysthymia. Participants were also screened for bipolar disorder ($n = 2$ excluded) and psychosis ($n = 1$ excluded). There was an excellent level of inter-rater reliability for diagnoses of current depression ($\kappa = 1$) and past major depression ($\kappa = 1$) between the original interviewer and an independent rater blind to condition, based on 10 randomly selected participants.

Response Style Questionnaire (RSQ) - Ruminative Responses Scale (RRS; Nolen-Hoeksema, 1991; Treynor, et al. 2003). The RSQ is a self-report measure which includes a 22 item Ruminative Response Scale (RRS), assessing the tendency to ruminate in response to depressed mood. Participants are asked to rate how often (almost never, sometimes, often, almost always) they think and do different things when feeling down, sad or depressed, e.g., “Think ‘why can’t I get going?’”. In this study the RRS had a high level of internal consistency (Time 1 $\alpha = .96$, Time 2 $\alpha = .96$). Brooding was measured using five items from the RRS scale, e.g., “Think ‘why do I always react this way?’” (Time 1 $\alpha = .85$, Time 2 $\alpha = .86$). Reflection was measured using another five items from the RRS measure, e.g., “Analyse recent events to try and understand why you are

depressed” (Time 1 $\alpha = .86$, Time 2 $\alpha = .81$).

The Inventory of Interpersonal Problems-64 (IIP-64; Alden, Wiggins, & Pincus, 1990). The IIP-64 is a self-report questionnaire measuring interpersonal difficulties, with eight subscales derived from dimensions of affiliation (hostile/cold to friendly behaviour) and dominance (submissive to controlling behaviour). Three of the eight IIP sub-scales were included in this study because previous research (Pearson et al., revised, Chapter 4) had found these behaviours to be specifically concurrently associated with rumination at baseline; Self-Sacrificing (e.g., “I put other people’s needs before my own too much”); Overly-accommodating (e.g., “I let other people take advantage of me too much”); Non-assertive (e.g., “I find it difficult to let other people know what I want”). These subscales demonstrated good internal consistency: Self-sacrificing (Time 1 $\alpha = .84$, Time 2 $\alpha = .89$); Overly-accommodating (Time 1 $\alpha = .82$, T2 $\alpha = .86$); Non-assertive (Time 1 $\alpha = .88$, Time 2 $\alpha = .90$).

Adult Rejection Sensitivity Questionnaire (ARSQ; Downey, Berenson, & Kang, 2006). The ARSQ consists of nine hypothetical situations involving interactions with partner, family, friends, and strangers, with the potential for rejection (e.g., “Lately, you’ve been noticing some distance between yourself and your significant other, and you ask him/her if there is something wrong”). Individuals rate the degree to which they are concerned about rejection and degree of anticipatory anxiety about rejection on two 6-point scales, with a composite rejection sensitivity score calculated by multiplying these ratings. The total rejection sensitivity score is the mean of these composite scores. The scale demonstrated good internal consistency (Time 1 $\alpha = .86$, Time 2 $\alpha = .86$). The ARSQ was included in this study because Pearson et al., (revised, Chapter 4) found that

rejection sensitivity was an attachment orientation most strongly associated concurrently with rumination ($p = .05$) compared to anxious and avoidant adult attachment styles which were not significantly associated concurrently with rumination after controlling for gender and depressive symptoms.

6.4.3 Interpersonal components

In a previous analysis of the baseline data for this study (Pearson et al., revised, Chapter 4) a Principal Components Analysis was calculated to address issues of multicollinearity between the interpersonal behaviour variables (IIP-64 sub-scales and the DIRI ERS sub-scale), and to reduce the number of variables which were included in the hierarchical regression analysis. This resulted in the extraction of three interpersonal components (accounting for 80.71% of the variance): Component 1, “submissive interpersonal style” had three items with salient loadings ($> .5$): the IIP subscales concerned with overly-accommodating, non-assertive, and self-sacrificing behaviours (eigenvalue = 3.27 after rotation). Component 2, labelled “needy interpersonal style” had three items with salient loadings ($> .5$): the IIP intrusive-needy and domineering sub-scales and excessive reassurance-seeking (eigenvalue = 2.85 after rotation). Component 3 labelled “cold interpersonal style” (eigenvalue = 3.38 after rotation) had three items with salient loadings ($> .5$): IIP cold, vindictive and socially inhibited sub-scales.

Findings from preliminary cross-sectional analyses (Pearson et al., revised, Chapter 4) indicated that the submissive interpersonal style was specifically associated with brooding after controlling for depressive symptoms. Because the needy and cold interpersonal styles were not associated concurrently with brooding they were excluded from the current study analyses.

Component scores for the baseline data were computed in SPSS using the regression method. The Time 2 component scores for the submissive interpersonal style were computed by first transforming each of the IIP scores to a z score and then multiplying the z score by the component score co-efficient (Field, 2005).

6.5 Procedure

Participants were interviewed by the researcher to assess baseline diagnostic status and then completed the battery of self-report questionnaires (Time 1). Six months later, participants were interviewed again to reassess diagnostic status and completed another set of the self-report measures (Time 2).

6.6 Results

6.6.1 Data analysis

The first set of hierarchical regression analyses assessed the contribution of baseline submissive interpersonal style and rejection sensitivity as predictors of rumination, brooding, and reflection six months later. The second set of analyses assessed the contribution of baseline rumination, brooding, and reflection as predictors of Time 2 submissive interpersonal style and rejection sensitivity. SPSS diagnostics were examined to ensure that the hierarchical regression models were not biased due to multi-collinearity or the influence of outliers and residuals.

6.6.2 Preliminary analyses

Table 6.1 presents the correlations between the key variables. Time 1 submissive interpersonal style, Time 1 rejection sensitivity, and Time 1 depression were all significantly positively correlated with Time 2 rumination (brooding and reflection).

Rumination at baseline was significantly positively correlated with the Time 2 measures of submissive interpersonal style and rejection sensitivity. Gender was not correlated with the key study measures at Time 2.

Table 6.1

Intercorrelations between Brooding, Reflection, Depressive Symptoms and Interpersonal Variables

	1	2	3	4	5	6	7	8	9	10	11
1. T1 Brooding	-	.60***	.72***	.49***	.73***	.57***	-.47***	-.45***	.57***	.47***	.03
2. T2 Brooding		-	.40***	.74***	.53***	.64***	-.39***	-.49***	.53***	.60***	-.02
3. T1 Reflection			-	.56***	.56***	.28**	-.24*	-.23**	.48***	.35***	.05
4. T2 Reflection				-	.39***	.43***	-.25*	-.33	.40***	.51***	-.08
5. T1 BDI					-	.66***	-.41***	-.42***	.58***	.41***	-.06
6. T2 BDI						-	-.50***	-.53***	.42***	.55***	.07
7. T1 Submissive							-	.87***	-.59***	-.51***	.21*
8. T2 Submissive								-	-.51***	-.55***	.11
9. T1 ARSQ									-	.67***	.05
10. T2 ARSQ										-	.10
11. Gender											-

Note. $N = 80 - 103$ due to missing data. Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS, BDI = Beck Depression Inventory-II, Submissive = Submissive interpersonal style (IIP component) ARSQ = Adult Rejection Sensitivity Questionnaire

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

6.6.3 *Submissive interpersonal style and rejection sensitivity as antecedents of rumination: do Time 1 interpersonal variables predict T2 brooding and reflection?*

To test our first hypothesis that submissive interpersonal style and rejection sensitivity at baseline prospectively predict increased rumination and brooding, but not reflection, at Time 2, we conducted two hierarchical regression analyses in which each of the Time 2 measures of rumination (brooding and reflection) were criterion variables respectively (Table 6.2 shows results for the hierarchical regression model in which brooding was the criterion variable). In each model, the Time 1 measure of rumination, gender and Time 1 depressive symptoms were entered at step 1 as control variables. The submissive interpersonal style and rejection sensitivity variables were entered simultaneously at step 2.

Table 6.2

Summary of Hierarchical Regression Analysis testing whether Time 1 Submissive Interpersonal Style and Time 1 Rejection Sensitivity predict Time 2 Brooding

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 Brooding	.40	3.48**	.30		75
	Gender	-.13	-.17			
	T1 BDI	.05	1.38			
Step 2	T1 Brooding	.35	2.97**	.35	.07*	73
	Gender	-.52	-.67			
	T1 BDI	.02	.44			
	T1 Submissive	.39	.83			
	T1 ARSQ	.26	2.84**			

Note: Brooding = Brooding sub-scale of the RRS, BDI = Beck Depression Inventory-II, Submissive = Submissive interpersonal style, ARSQ = rejection sensitivity. * $p < .05$, ** $p < .01$, *** $p < .001$

When brooding was the criterion variable, Time 1 brooding was a significant predictor of Time 2 brooding at step 1, $\beta = .40$, $t(75) = 3.48$, $p < .001$. Neither gender nor Time 1 depression predicted Time 2 brooding (gender, $\beta = -.13$, $t(75) = -.17$, $p = .86$, depression, $\beta = .05$, $t(75) = 1.38$, $p = .17$). Together these control variables explained 32% of the variance in Time 2 brooding and the model was statistically significant, $F(3, 75) = 11.87$, $p < .001$. Adding the interpersonal variables at step 2 significantly improved the model, $\Delta R^2 = .07$, $p < .05$ and the model was statistically significant, $F(5, 73) = 9.36$, $p < .001$. Time 1 rejection sensitivity was a significant predictor of Time 2 brooding, $\beta = .26$, $t(73) = 2.84$, $p < .01$, although the submissive interpersonal style was not a significant predictor of brooding, $\beta = .39$, $t(73) = .83$, $p = .41$.

When an equivalent hierarchical regression analysis was calculated with the reflection sub-scale as the criterion variable, the pattern of results for step 1 was the same as for the previous model in which brooding was the criterion variable. Adding the interpersonal variables at step 2 did not significantly improve the model, $\Delta R^2 = .04$, $p = .14$, although the overall model was statistically significant, $F(5, 73) = 7.70$, $p < .001$. In addition, Time 1 rejection sensitivity was a significant predictor of Time 2 reflection, $\beta = .18$, $t(73) = 1.97$, $p = .05$. The submissive interpersonal style was a non-significant predictor of Time 2 reflection, $\beta = .27$, $t(73) = .60$, $p = .55$.¹

6.6.4 Rumination as an antecedent of the submissive interpersonal style and rejection sensitivity: do Time 1 brooding and reflection predict the submissive interpersonal style and rejection sensitivity?

To test our second hypothesis that rumination will prospectively predict increased submissiveness and rejection sensitivity controlling for baseline interpersonal style, gender and depression we conducted one hierarchical regression model in which the Time 2 submissive interpersonal style was the criterion variable (Table 6.3), and another hierarchical regression model in which Time 2 rejection sensitivity was the criterion variable (Table 6.4).

Table 6.3

Summary of Hierarchical Regression Analysis testing whether Time 1 Rumination Predicts Time 2 Submissive Interpersonal Style

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 Submissive	.88	13.78***	.76		79
	Gender	-.07	-.55			
	T1 BDI	.002	.30			
Step 2	T1 Submissive	.89	12.76***	.76	-	77
	Gender	-.07	-.56			
	T1 BDI	.001	.20			
	T1 Brooding	.01	.31			
	T1 Reflection	-.01	-.28			

Note: Submissive = Submissive interpersonal style, BDI = Beck Depression Inventory-II, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6.4

Summary of Hierarchical Regression Analysis testing whether Time 1 Rumination Predicts Time 2 Rejection Sensitivity

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 1	T1 ARSQ	.65	6.44***	.44		75
	Gender	.63	.70			
	T1 BDI	-.02	-.41			
Step 2	T1 ARSQ	.62	5.92***	.44	-	73
	Gender	.55	.62			
	T1 BDI	-.04	-.97			
	T1 Brooding	.21	1.28			
	T1 Reflection	-.06	-.37			

Note: ARSQ = rejection sensitivity, BDI = Beck Depression Inventory=II, Brooding = Brooding sub-scale of the RRS, Reflection = Reflection sub-scale of the RRS.

When the submissive interpersonal style was the criterion variable, neither brooding nor reflection were significant predictors of Time 2 submissive interpersonal style (brooding, $\beta = .01$, $t(77) = .31$, $p = .76$, reflection, $\beta = -.01$, $t(77) = -.28$, $p = .78$), although the overall model was statistically significant, $F(5, 77) = 50.18$, $p < .001$. Similarly, when rejection sensitivity was the criterion variable, neither brooding nor reflection were significant predictors of Time 2 rejection sensitivity (brooding, $\beta = .21$, $t(73) = 1.28$, $p = .21$, reflection, $\beta = -.06$, $t(73) = -.37$, $p = .71$), although the overall model was statistically significant, $F(5, 73) = 13.03$, $p < .001$.

6.7 Discussion

This study investigated the temporal relationship between rumination (brooding and reflection), a submissive interpersonal style encapsulating overly-accommodating, self-sacrificing, and non-assertive behaviours, and rejection sensitivity, both of which were previously found to be specifically associated with rumination concurrently (Pearson et al., under revision, Chapter 4). We tested two contrasting but not mutually exclusive hypotheses: (a) an interpersonal style characterised by submissiveness and rejection sensitivity are antecedents and potential causes of rumination (e.g., Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, et al., 1999; Saffrey & Ehrenberg, 2007); (b) rumination is an antecedent and potential cause of the submissive interpersonal style and rejection sensitivity (e.g., Lyubomirsky, et al., 1999; Nolen-Hoeksema, 2004; Tse & Bond, 2004).

Partially consistent with the first hypothesis, we found that rejection sensitivity prospectively predicted rumination (brooding, $p < .01$, and reflection, $p \leq .05$) six months later, after controlling for baseline rumination, depression and gender. Contrary to our stated predictions, the submissive interpersonal style did not predict rumination (brooding or reflection). Inconsistent with the second hypothesis, rumination (brooding and reflection) did not significantly predict increased submissiveness or rejection sensitivity six months later, after controlling for baseline interpersonal style, depression and gender. Thus, it appears that rejection sensitivity is a temporal antecedent of rumination, but that the submissive interpersonal style is not temporally antecedent to increased rumination.

The findings are consistent with the hypothesis that rejection sensitivity causes rumination, but are inconsistent with the hypothesis that rumination causes rejection

sensitivity. Thus, the results provide a necessary, but not sufficient, first step towards clarifying the causal nature of relationship between rejection-sensitivity and rumination. If the hypothesis that rejection sensitivity plays a causal role in rumination is correct, then as a minimum, one would expect to see that rejection sensitivity predicts subsequent rumination: Failure to find this relationship would disconfirm the hypothesis that rejection sensitivity causally contributes to rumination. However, the predictive relationship could still be accounted for by a third factor that predicts both rejection sensitivity and rumination. For example, childhood abuse is associated with both rumination (Nolen-Hoeksema, 2004) and rejection sensitivity (Feldman & Downey, 1994), and could potentially predict both variables. Therefore, to determine if rejection sensitivity does causally influence rumination, rejection sensitivity needs to be manipulated and shown to then directly influence levels of rumination, either in experimental studies or via clinical interventions.

These findings are also consistent with a control theory (Carver & Scheier, 1990, 1998) account of rumination (Martin & Tesser, 1996; Watkins, 2008). In goal-discrepancy terms, rejection sensitivity renders the goals of maintaining relationships and avoiding abandonment especially salient and intrinsically linked to self definition (Ayduk & Gyurak, 2008), whilst at the same time increasing the likelihood of perceiving rejection (Downey & Feldman, 1996; Mor & Inbar, 2009). Thus individuals who are highly sensitive to rejection are more likely to perceive that the valued goals of avoiding rejection and maintaining relationships are not being met, generating the unresolved goal discrepancies that drive rumination (Martin & Tesser, 1996). Moreover, according to the control theory model, it will be particularly difficult for individuals to disengage from the

goal of preventing rejection because this is an avoidance goal which cannot be satisfactorily resolved (Carver & Scheier, 1998), thus making it more likely that rejection sensitivity will generate ongoing cycles of ruminative thinking (i.e., unresolved goal related thoughts) than attainment related goals which have a more clearly demarcated end point.

We note that when the submissive interpersonal style and rejection sensitivity were entered into the regression equation, only rejection sensitivity predicted future rumination, whereas the submissive interpersonal style did not. One reason why rejection sensitivity emerges as the only significant predictor of rumination might be because it predicts submissive interpersonal behaviours. Consistent with this possibility, rejection sensitivity has been found to cause individuals to respond to perceived rejection or threat of rejection with withdrawing or overly-accommodating responses (Ayduk & Gyurak, 2008, Ayduk, May, Downey, & Higgins, 2003; Harper, Dickson, & Welsh, 2006). Thus, rejection sensitivity may be the better predictor of rumination, because it already accounts for much of the variance in relationship between the other interpersonal behaviours and rumination. Another possibility is that whilst both rejection-sensitivity and submissive interpersonal behaviours prevent effective resolution of goal discrepancies, thereby driving further rumination, only rejection sensitivity involves a heightened vigilance for important goals not being met, which could initiate new cycles of rumination.

Some limitations of the study should be noted. First, as noted earlier, because the study design included only two time points and there was no manipulation of the key variables, inferences about the causal relationship between rumination, brooding, and the

interpersonal style are limited. However, to our knowledge, this is the first study to test the prospective relationship between depressive rumination, rejection sensitivity, and the submissive interpersonal style, thereby, providing a first step in examining the causal direction of the relationship between rumination, attachment orientation and interpersonal style. Second, the current study used a relatively small sample size, potentially limiting statistical power to detect relationships between variables. Another limitation is the reliance on self-report measurement of rumination and interpersonal behaviours, introducing the potential for measurement inaccuracy and/or biased responses. Nonetheless, these findings suggest that rejection sensitivity is a specific temporal antecedent of depressive rumination. Key strengths of the study were its prospective design, statistically controlling for baseline rumination, depression, and gender in predicting future rumination, and inclusion of a heterogeneous mix of currently depressed, previously depressed, and never depressed individuals, to maximize the range of depression and rumination scores, and to increase the generalizability of the findings.

The finding that rejection sensitivity prospectively predicts increased brooding has implications for clinical assessment and treatment. First, this finding suggests that when a clinician identifies that an individual is highly sensitive to rejection, he/she should be alert to the possibility that this individual might also be engaging in ruminative thinking, as a maladaptive regulatory mechanism for maintaining relationships and avoiding rejection. Second, the findings raise the interesting possibility that interpersonal interventions which target rejection sensitivity might also reduce the likelihood that people will go on to engage in harmful cycles of rumination.

In conclusion, the results suggest that rejection sensitivity is a specific prospective

predictor for increased depressive rumination and brooding, whilst indicating that rumination does not prospectively predict rejection sensitivity or passive interpersonal behaviours. Future research will need to more fully delineate the causal direction of the relationship between rumination and rejection sensitivity, with the aim of informing the development of integrative cognitive and interpersonal interventions for those susceptible to either difficulty.

Footnote

¹We replicated the analyses with the whole rumination scale as the criterion variable and a similar pattern of results was obtained. Time 1 rumination was a significant predictor of Time 2 rumination at step 1, $\beta = .39$, $t(75) = 3.40$, $p < .01$. Neither gender nor Time 1 depression predicted Time 2 rumination (gender, $\beta = .48$, $t(75) = .17$, $p = .87$, depression, $\beta = .24$, $t(75) = 1.62$, $p = .11$). Together these control variables explained 38% of the variance in Time 2 rumination and the model was statistically significant, $F(3, 75) = 15.39$, $p < .001$. Adding the interpersonal variables at step 2 did not significantly improve the model, $\Delta R^2 = .04$, $p = .07$, although the model was statistically significant, $F(5, 73) = 10.74$, $p < .001$. Time 1 rejection sensitivity was a significant predictor of Time 2 rumination, $\beta = .75$, $t(73) = 2.18$, $p < .05$, the submissive interpersonal style was not a significant predictor of rumination, $\beta = .75$, $t(73) = 2.18$, $p = .82$.

6.8 Appendix: Rejection sensitivity predicts submissive interpersonal style

A supplementary analysis was undertaken to test whether rejection sensitivity predicts submissive interpersonal behaviours, as predicted by the hypothesised thesis model (path 2). When the Time 2 measure of the submissive interpersonal style was the criterion variable, Time 1 submissive interpersonal style was a significant predictor of Time 2 submissive interpersonal style at step 1, $\beta = .89$, $t(71) = 12.58$, $p < .001$. Neither gender nor Time 1 depression predicted Time 2 submissive interpersonal style (gender, $\beta = -.07$, $t(71) = -.54$, $p = .59$, depression, $\beta = .01$, $t(71) = .84$, $p = .41$). Together these control variables explained 75% of the variance in Time 2 submissive interpersonal style and the model was statistically significant, $F(3, 71) = 70.57$, $p < .001$. Adding rejection sensitivity at step 2 did not significantly improved the model, $\Delta R^2 = 0$, $p = .82$, although the overall model was statistically significant, $F(4,70) = 52.23$, $p < .001$. Time 1 rejection sensitivity was not a significant predictor of Time 2 submissive interpersonal style, $\beta = -.004$, $t(70) = -.23$, $p = .82$.

CHAPTER 7: Adverse interpersonal consequences of rumination: chronic stress and poor social adjustment

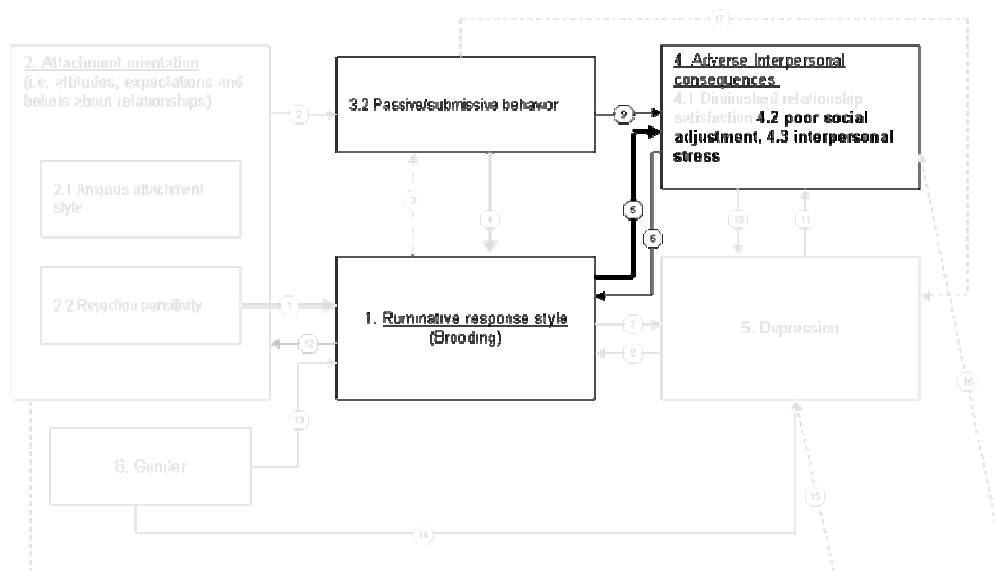
7.1 Preface

Extending the preliminary findings reported in Chapter 3, which demonstrated that rumination prospectively predicted diminished relationship satisfaction, the focus for Chapter 7 is a more detailed investigation of the second thesis hypothesis, that rumination has adverse interpersonal consequences (path 5 in the proposed thesis model). This chapter provides a more rigorous empirical evaluation of the models outlined previously (Lyubomirsky & Tkach, 2004; Tse & Bond, 2004) which proposed that rumination generates adverse interpersonal consequences by occupying cognitive resource necessary for effective social perception, biasing how individuals interpret social cues and inhibiting effective problem solving and pro-social behaviour. This chapter consists of a paper, submitted to Behaviour Research and Therapy, which reports the main elements of the study, plus this preface and an appendix including supplementary analyses (sections 7.8 – 7.10).

Having established that rumination prospectively predicts diminished relationship satisfaction (Chapter 3), three different indexes of adverse interpersonal consequences were employed in this chapter (Figure 7.1).

Figure 7.1

Hypothesised Thesis Model: Study 5, Hypothesis 2



First, drawing on the literature surrounding stress generation in depression (described in more detail in section 2.3.3), the study incorporated a measure of dependent (i.e., self-generated) interpersonal event stress. Importantly, a contextual threat method was used (Life events and difficulties schedule - Brief version; Bifulco et al., 1989; Brown & Harris, 1978) to evaluate interpersonal event stress. This approach is recommended method for assessing life event stress because it enables differentiation between dependent and independent events, and facilitates the objective evaluation of event impact, taking account of relevant contextual factors (Hammen, 2006; Roberts & Ciesla, 2007). The approach is very time consuming because the interview takes a considerable time to both administer and code.

Second, the study incorporated a measure of chronic interpersonal stress which involved assessment of ongoing conditions and functioning in specific role areas (relationships with partner, children, extended family and friends). Previous

studies indicate that the stress generation phenomenon applies to both discrete events and chronic stress (Davila, Hammen, Burge, Paley, & Daley, 1995; Holahan, Moos, Holahan, Brennan, & Schutte, 2005). However, it is unclear in the current literature whether the same mechanisms are implicated in the generation of both interpersonal event stress and chronic interpersonal stress because some studies did not assess both, or did not examine them separately.

Third, a measure of social adjustment was included (The Social Adjustment Scale-Self-Report, SAS-SR, Weissman, 1999). The SAS-SR is a 54 item self-report questionnaire which, similar to the conceptualisation of chronic stress, assesses instrumental (individual adaptation within society and what one does in the world) and expressive (maintenance of interpersonal relations among members of social group, how one relates to others in the world) role performance over the past two weeks. The SAS-SR was included because it has been widely used to index change in social adjustment, in clinical trials evaluating pharmacological and psychological treatment of depression (for a review see Bosc, 2000), and has previously demonstrated good internal consistency and external validity (Weissman, 1999). The prospective relationship between rumination and poor social adjustment is reported in section 7.8 (Appendix B). This analysis was positioned as an appendix (rather than with the other main analyses, section 7.5) because the main analyses comprised part of a paper submitted for publication. The paper focused specifically on the role of rumination in 'stress generation' in depression (with dependent event stress and chronic interpersonal stress the key criterion variables of interest). Consistent with the broader thesis aim, to investigate adverse interpersonal consequences of rumination, a more comprehensive assessment was facilitated by including an index of social adjustment, which encapsulated 'an individual's adaptation in the larger society and to

his or her relations to external goal objects – what one does in the world’ (Weissman, 1999, p. 2). It should be noted that, despite being located as an appendix, the hierarchical regression analysis which investigated the prospective relationship between rumination and poor social adjustment is a key part of the thesis.

In study 5 results are reported from a series of hierarchical regression analyses in which the measures of interpersonal stress and social adjustment were the criterion variables. The analyses investigating whether rumination predicts interpersonal event stress and chronic interpersonal stress are incorporated within a paper in which the role of anxious attachment style and excessive reassurance-seeking as mechanisms of stress generation was also examined. Anxious attachment style, excessive reassurance-seeking, and rumination (brooding) formed a focus for this paper because there is a clear theoretical rationale, as summarised in the paper introduction (section 7.3), for hypothesizing that these specific interpersonal factors are implicated in stress generation.

The results obtained were partially consistent with the proposed thesis model. Contrary to the stated predictions, rumination (brooding) did not predict increased interpersonal event stress. However, brooding did prospectively predict increased chronic interpersonal stress and poor social adjustment six months later. Conversely, anxious attachment style and excessive reassurance-seeking predicted increased interpersonal event stress, but did not predict increased chronic interpersonal stress.

Supplementary analyses (7.8 appendices) tested the following predictions: (a) chronic stress predicts rumination at time 2 (i.e., an assessment of whether there is a reciprocal relationship between rumination and chronic strain as hypothesised by Nolen-Hoeksema, Larson, & Grayson, 1999). This prediction was supported by the data ($p = .05$); (b) rumination predicts poor social adjustment six months later. This

prediction was supported by the data, $p < .01$, and, vice-versa, whether time 1 social adjustment predicts increased rumination (not supported by the data, $p = .09$); (c) a final set of supplementary analyses tested whether the maladaptive, submissive, needy and cold, interpersonal styles (as described previously) predicted interpersonal event stress, chronic interpersonal stress, and poor social adjustment. These final analyses enabled clarification that needy interpersonal behaviours such as excessive reassurance-seeking are specifically implicated in the process of stress generation (as hypothesised in study 5) rather than the effect of excessive reassurance-seeking being attributable to maladaptive interpersonal behaviour more generally (this was unclear from previous studies which implicate excessive reassurance-seeking as being a mechanism of stress generation which have not controlled for the effect of other maladaptive interpersonal behaviours, e.g. Potthoff, Holahan, & Joiner, 1995).

The findings suggest that different mechanisms are implicated in the generation of serious interpersonal events and chronic interpersonal stress. This raises the question of why rumination (brooding) might contribute to the maintenance of chronic stress, but not the generation of discrete interpersonal events. It is proposed that this finding might reflect the fundamentally passive nature of rumination. Because ruminators tend to have low perceived mastery over their environment (Nolen-Hoeksema, Larson, & Grayson, 1999) and because rumination inhibits motivation and impairs problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999), it is less likely that those with a tendency to ruminate will assert control in their relationships, and it is more likely that they will employ submissive conflict avoidance strategies. Therefore, this combination of rumination and conflict avoidance might be a factor which maintains chronic stress (e.g., staying in an unsupportive relationship). Moreover, as elaborated

further in the discussion, a high score on the measure of chronic strain used in the study indicated either conflictual relationships or lack of social support. Thus, one possibility, which warrants further investigation, is that brooding exacerbates chronic strain by contributing to the diminishment of social support, fuelling social withdrawal and increasing isolation.

Brooding, excessive reassurance-seeking, and anxious attachment style as
mechanisms of stress generation

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7.2 Abstract

In an endeavour to advance understanding of stress generation in depression, this study tested whether anxious attachment, excessive reassurance-seeking, and rumination predicted increased dependent interpersonal event stress and chronic interpersonal stress in a heterogeneous adult sample. At baseline assessment, participants were interviewed to assess diagnostic status and completed questionnaire measures assessing attachment style, excessive reassurance-seeking, and brooding. Six months later, participants were interviewed again, using a contextual threat method, to assess life events and chronic interpersonal stress occurring over the study duration. As hypothesised, anxious attachment style and excessive-reassurance seeking predicted increased dependent interpersonal event stress (but not chronic stress). Anxious attachment style mediated the effect of excessive reassurance-seeking on dependent interpersonal event stress. Unexpectedly, brooding did not predict dependent interpersonal event stress. However, as predicted, brooding did predict increased chronic interpersonal stress. The results suggest that different mechanisms might underpin the generation of more severe interpersonal life events such as divorce and major arguments versus the chronic interpersonal stress associated with poor social support and ongoing relationship tensions.

Key words: stress-generation, rumination, attachment style, excessive reassurance-seeking

7.3 Introduction

There is an extensive literature which indicates that exposure to stressful life events interacts with cognitive vulnerabilities to predict depression (for review, see Abramson, et al., 2002). However, in contrast to traditional diathesis-stress models, the stress generation model assumes that those vulnerable to depression are not passive recipients of stressors, but that they actively contribute to the stress experienced (Hammen, 1991, 2006), and that this stress generation further contributes to the maintenance of depression.

Central to the stress generation model is the distinction between independent stressful events, which are unequivocally outside of the individual's control (e.g., a family member dies), versus dependent stressful events, to which an individual at least partially contributes, such as conflict with close family (Rudolph & Hammen, 1999). In a seminal study, Hammen (1991) found that women who were currently depressed or recently remitted from depression experienced significantly more dependent event stress and, specifically, dependent interpersonal event stress, than women with chronic medical illness, women with bipolar disorder, or healthy controls, but that they did not differ in the level of independent event stress experienced.

Although this stress generation effect of depression was initially demonstrated for discrete life events in women (Hammen, 1991), depression has been repeatedly found to prospectively predict both discrete life events and ongoing chronic stressors (Davila, Hammen, Burge, Paley, & Daley, 1995; Holahan, Moos, Holahan, Brennan, & Schutte, 2005). Moreover, the stress generation effect has been replicated in a range of clinical and community samples including men and women (Chun, Cronkite, & Moos, 2004; Cui & Vaillant, 1997; Harkness & Luther, 2001), children and

adolescents (Hammen & Brennan, 2001; Rudolph & Hammen, 1999) and older adults (Holahan, et al., 2005). Moreover, the stress generation effect has been found both for individuals meeting diagnostic criteria for current or former depression (e.g., Daley, et al., 1997; Hammen, 1991), and for those with elevated depressive symptoms (e.g., Davila, et al., 1995; Potthoff, Holahan, & Joiner, 1995).

Setting a future research agenda, Hammen (2006, p.1070) argued that stressful events generated by those vulnerable to depression are ‘not merely the consequences of depressive symptoms but are somehow related to enduring cognitions, traits, behaviours and circumstances’. Therefore, understanding the phenomenon of stress generation in depression necessitates demonstrating which specific factors explain this process beyond the presence of depressive symptoms. Interpersonal and cognitive theories of how depression impairs social functioning provide a useful starting point for delineating specific mechanisms implicated in stress generation.

First, drawing on an attachment framework, Mikulincer, Shaver, and Pereg (2003, p. 85) argued that anxiously attached individuals generate a ‘self amplifying cycle of distress’, whereby hyper-vigilance to rejection intensifies negative emotional response to perceived stressful events, triggers harmful rumination, and fuels maladaptive interpersonal behaviour such as excessive reassurance-seeking. Consistent with the hypothesis that anxious attachment style generates interpersonal stress, it is associated with poor interpersonal functioning (Cyranski, et al., 2002) and diminished (self and partner reported) relationship satisfaction (Collins & Read, 1990), and prospectively predicts increased experience of interpersonal stressors (i.e., stress generation, Hankin, Kassel, & Abela, 2005). Moreover, related interpersonal constructs such as sociotropy (Shih, 2006) and dependency (Mongrain & Zuroff, 1994), which reflect similar concerns about rejection and abandonment, also predict

increases in interpersonal stress.

Second, Coyne's (1976a, 1976b) interactional theory of depression posits that depressed individuals generate adverse interpersonal consequences by engaging in excessive reassurance-seeking behaviour, characterised by 'repetitive and persistent requests for reassurance from others in order to manage feelings of low self-worth and depression' (Weinstock & Whisman, 2007, p.333). The model assumes that close others are initially supportive, but that, because the depressed individual doubts the authenticity of reassurance provided and continues to seek further reassurance, other people become increasingly frustrated, generating conflict and eventual rejection. As predicted by Coyne's model, excessive reassurance seeking has been shown to confer increased risk of rejection (Joiner, Alfano, & Metalsky, 1992), and to prospectively predict increased minor social stressors (Potthoff, Holahan, & Joiner, 1995).

Third, Response Styles Theory (RST) conceptualizes rumination, defined as, 'repetitively focusing on depressive symptoms and their causes and meanings' (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, p.400), as being an important cognitive mechanism implicated in the generation of adverse interpersonal consequences in depression, which in turn fuel further rumination (Lyubomirsky & Tkach, 2004; Tse & Bond, 2004). Tse and Bond (2004) proposed that rumination impairs social functioning by occupying cognitive resource necessary for effective social perception, inhibiting effective interpersonal problem solving and adaptive, pro-social, behaviours and fuelling maladaptive interpersonal behaviours such as excessive reassurance-seeking. Consistent with this proposed vicious cycle between rumination and adverse interpersonal consequences, experimentally induced rumination has been found to impair interpersonal problem solving and reduce motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky,

Tucker, Caldwell, & Berg, 1999). Moreover, rumination is associated with reduced social support, increased friction and diminished relationship satisfaction (Nolen-Hoeksema & Davis, 1999) and prospectively predicts increased chronic strain (Nolen-Hoeksema, Larson, & Grayson, 1999).

Thus, relevant theory and supporting empirical evidence suggests that anxious attachment style, excessive reassurance-seeking, and rumination are all potential mechanisms which separately contribute to stress generation in depression. Moreover, the theories discussed also suggest inter-relationships between these mechanisms. For example, anxious attachment style might generate interpersonal stress by triggering excessive-reassurance seeking behaviour and/or fuelling rumination (Hankin, et al., 2005; Mikulincer, et al., 2003) and, rumination might indirectly contribute to stress generation by fuelling excessive reassurance-seeking (Tse & Bond, 2004). These potential inter-relationships raise the question of whether these mechanisms operate independently in generating adverse interpersonal consequences, or whether the effect of one mechanism might be dependent on one or more of the others.

There are a number of limitations with the current evidence concerning our understanding of the stress generation effect of anxious attachment style, excessive reassurance-seeking and rumination. First, a number of studies relied on student samples (Hankin, et al., 2005; Potthoff, et al., 1995). Second, many studies used self-report questionnaire measures to assess stressful life events rather than contextual interviews (Hankin, et al., 2005; Potthoff, et al., 1995), and some did not distinguish between dependent and independent stressful events (Hankin, et al., 2005). The use of contextual interviews (Brown & Harris, 1978; Hammen, 1991) is seen as the gold standard necessary to enable systematic and objective assessment of interpersonal stress (Hammen, 2006; Roberts & Ciesla, 2007). Third, some studies used short

follow-up periods (Potthoff, et al., 1995, five week period, Bottonari, Roberts, Kelly, Kashdan, & Ciesla, 2007, three month period). Fourth, some studies assessed either only discrete interpersonal events (Bottonari, et al., 2007; Hammen, 1991; Potthoff, et al., 1995) or chronic stress (Nelson, et al., 2001), but not both. Thus, it is currently somewhat unclear in the literature whether the same mechanisms are implicated in the generation of stress associated with serious life events and perpetuation of more mundane stressors associated with day to day living.

To the best of our knowledge, no previous study has tested the direct effect of rumination on stress generation using the contextual interview method, nor examined the specific role of brooding, defined as ‘a passive comparison of one’s current situation with some unachieved standard’ (Treyner, Gonzalez, & Nolen-Hoeksema, 2003, p.256), which is recognized as being the most maladaptive subcomponent of rumination (Treyner, et al., 2003). Therefore, the first aim was to assess if rumination, and more specifically the maladaptive brooding sub-component, is a stress generation mechanism, using the contextual threat method.

Some inconsistent findings have occurred in studies using contextual interviews and clinical samples to examine the effect of anxious attachment on stress generation. For example, Bottonari, et al. (2007) failed to find that anxious attachment style predicted stress generation; Shaver, Schachner, and Mikulincer (2007) found that avoidant not anxious attachment style predicted relationship difficulties, and Hankin, Kassel, and Abela (2005) found that both anxious and avoidant attachment styles predicted increased interpersonal stress. Therefore, the second aim of the study was to empirically test these theories and to clarify these conflicting findings, using a robust methodology which addresses the limitations outlined above. Finally, the third aim of the study was to provide a preliminary examination of the joint relationship

between anxious attachment style, excessive reassurance-seeking, and rumination (brooding) in predicting interpersonal stress.

Drawing on the theories and research findings noted above, the current study tested the following hypotheses: 1) Anxious attachment style will prospectively predict increased dependent interpersonal event stress and chronic interpersonal stress, but not independent event stress, controlling for depression status (current major depression and past history of depression) and gender. 2) Excessive reassurance-seeking will prospectively predict increased dependent interpersonal event stress and chronic interpersonal stress, but not independent event stress, controlling for depression status (current major depression and past history of depression) and gender. 3) Brooding will prospectively predict increased dependent interpersonal event stress and chronic interpersonal stress, but not independent event stress, controlling for depression status (current major depression and past history of depression) and gender. 4) A specific prediction was not made about the joint relationship between anxious attachment style, excessive reassurance-seeking, and rumination. Although, the theory discussed indicates that these mechanisms are inter-related, it does not generate one clear prediction regarding the nature of this relationship. One possibility is that excessive reassurance-seeking and rumination are proximal mechanisms which mediate the effect of anxious attachment style on interpersonal stress (Mikulincer, et al., 2003).

A pre-requisite for testing the main hypotheses was first replicating the basic stress generation effect that depression status (current major depression and past history of depression) will prospectively predict increased dependent interpersonal event stress and chronic interpersonal stress, but not independent event stress.

7.4 Method

7.4.1 Participants

At baseline (Time 1), participants ($N = 103$) were recruited from a primary care service for depression ($n = 25$) and from the wider community ($n = 78$). For further details, see Pearson et al. (in revision, Chapter 4), which reported on the cross-sectional analysis at baseline of this sample. Participants were recruited via a poster campaign which invited currently depressed, previously depressed, and never depressed individuals to take part in the study. The aim of this recruitment strategy was to maximize the variance of depressive symptoms, rumination, and social functioning impairment in the sample, and, thereby, enhance our ability to detect relationships between variables and to increase generalizability of the results. Thus, our intention was to examine brooding, insecure attachment style, and excessive reassurance-seeking as continuous variables across this mixed, heterogeneous sample.

Analyses revealed that those who did not continue to follow up were not significantly different from those who completed both sessions in relation to level of depressive symptoms, brooding, interpersonal difficulties, age or gender distribution (5.9 Appendix B). Exclusion criteria included a history of bipolar disorder ($n = 2$ excluded), psychotic symptoms ($n = 1$ excluded), being unable to engage for physical or practical reasons, and current suicidal ideation (no participants were excluded on the basis of these final two criteria). Of the baseline sample, 92 attended a follow-up interview six months later (Time 2, female $n = 65$, male $n = 27$). The regression analyses reported were based on the sample of individuals who participated in both baseline and follow-up sessions. The regression analyses reported were based on the sample of individuals who participated in both baseline and follow-up sessions.

7.4.2 Measures

Structured Clinical Interview for DSM-IV: Mood Disorders Module (SCID;

First, Spitzer, Gibbon & Williams, 1997). The SCID is a semi-structured diagnostic interview which is widely used in a clinical and research context to facilitate reliable DSM-IV diagnoses. The SCID Mood Disorders module (and preliminary screening questions which assessed for psychotic symptoms) was used to assess whether the individuals interviewed met the DSM-IV criteria for a current major depressive episode (MDE), for one or more past episodes of major depression, and/or dysthymia at the baseline assessment. Two male participants met criteria for current dysthymia: because they had elevated depressive symptoms they were assigned as being currently depressed for the purposes of comparing groups¹. There was an excellent level of inter-rater reliability for diagnoses of current depression, $\kappa = 1$, and past major depression, $\kappa = 1$, between the original interviewer and an independent rater blind to condition, based on ten randomly selected participants.

Life Events and Difficulties Schedule (LEDS brief version; Bifulco, et al., 1989; Brown & Harris, 1978). Episodic stress which occurred between the baseline and follow-up assessments was assessed using a contextual threat interview modelled on the procedure developed by Brown and Harris (1978). Participants were asked to provide a detailed description of events, including date of occurrence and event duration, relevant contextual factors (e.g., coping resources, event expectedness, prior experience with the event) and event consequences. A written report was prepared for each interview by another research officer (who observed a video recording) who was blind to participant diagnostic status. This second research officer subsequently rated events according to impact, independence, and event type (interpersonal/not interpersonal).

A 5 point scale was used to assess event impact, with a score of 1 indicating that the event had little or no impact (i.e., essentially positive events) and 5 indicating

that the event had very serious consequences (e.g., threat to life of self or close other). Consistent with previous studies (e.g., Daley, et al., 1997, Rudolph & Hammen, 1999), events with a 1 impact rating were excluded from the analyses². Events were assessed for independence using another 5 point scale from 1 (*event completely independent*) to 5 (*event entirely dependent*). Emulating previous studies (e.g., Daley et al., 1997; Daley, Hammen, Davila, & Burge, 1998) events assigned an independence score of 3 or greater were classified as dependent for the purposes of the analyses. Events were also classified as being interpersonal or not interpersonal. Interpersonal events were defined as those which involved an interaction with another person or that directly affected the relationship between the individual and another person (Rudolph, 2008). Total dependent interpersonal event stress and independent event stress scores were computed for each participant by summing the impact rating for dependent interpersonal events and independent events respectively. Ten percent of the interviews (9 interviews) were double rated to check inter-rater reliability, revealing a good level of inter-rater reliability for event independence, $\kappa = .85$, threat, $\kappa = .75$, and event type (interpersonal/not interpersonal), $\kappa = .86$.

UCLA Life stress interview (Chronic stress assessment, Hammen et al., 1987; 2004). Chronic stress (assessment of ongoing conditions and functioning in specific role areas) was assessed using an adapted version of the UCLA chronic stress interview (Hammen et al., 1987). Four sources of chronic interpersonal stress were systematically assessed: Romantic partner relationship, family relationships (parental, children, and sibling relationships), close friendships and wider social network. Chronic stress in each domain was rated on a 5 point scale (where 1 indicated an exceptionally low level of chronic stress and 5 indicated a severe level of chronic stress). A total interpersonal chronic stress score was calculated by summing the

chronic stress score in each domain. Ten per cent of the interviews were double rated to check inter-rater reliability, revealing a good level of inter-rater reliability for chronic stress, $\kappa = .75$.

Response Style Questionnaire (RSQ) - Ruminative Responses Scale - Brooding and Reflection sub-scales (RRS; Nolen-Hoeksema, 1991; Treynor, et al., 2003). The RSQ is a self-report measure which includes a 22 item Ruminative Response Scale (RRS), assessing the tendency to ruminate in response to depressed mood. Participants are asked to rate how often (almost never, sometimes, often, almost always) they think and do different things when feeling down, sad or depressed, e.g., “Think ‘why can’t I get going?’” Brooding was measured using five items from the RRS scale, e.g., “Think ‘why do I always react this way?’” (T1 $\alpha = .85$). Reflection was measured using another five items from the RRS measure, e.g., “Analyse recent events to try and understand why you are depressed” (T1 $\alpha = .86$).

Experiences in Close Relationships Questionnaire-Revised (ECR-R; Fraley, Waller, & Brennan, 2000, Brennan, Clark, & Shaver, 1997). The ECR-R is a 36-item questionnaire which measures two dimensions of attachment style in romantic relationships: avoidance (discomfort with closeness and dependency; e.g., “I prefer not to show a partner how I feel deep down”) and anxiety (fear of abandonment; e.g., “I’m afraid that I will lose my partner’s love”). Individuals rate each item on a 7-point scale from 1 (disagree strongly) to 7 (agree strongly). Both sub-scales had good internal consistency (ECR Avoidance, $\alpha = .92$, ECR Anxiety, $\alpha = .91$).

Depressive Interpersonal Relationships Inventory – Excessive reassurance-seeking Scale (DIRI-ERS; Joiner & Metalsky, 2001). The DIRI-ERS is a four-item sub-scale of the DIRI which measures frequency of engaging in excessive reassurance-seeking behaviours (e.g., “In general, do you find yourself often asking

the people you feel close to how they truly feel about you?") on a seven-point scale from 1 (*no, not at all*) to 7 (*yes, very much*). The scale demonstrated good internal consistency ($\alpha = .88$). We only administered the ERS scale and not the other subscales of the DIRI (general dependency, need for approval, doubting others sincerity) because (a) previous psychometric analyses have demonstrated the ERS to be a cohesive interpersonal factor with internal consistency, factorial rigor, discriminability and convergent validity (Joiner & Metalsky, 2001); (b) only ERS is implicated in the development of future depression; (c) ERS has been used as an independent measure of excessive reassurance-seeking, setting a valid methodological precedent which the current study follows (e.g., Joiner & Schmidt, 1998, Katz, Beach, & Joiner, 1998, Potthoff, et al., 1995, Shaver, et al., 2005); (d) to reduce participant burden.

7.5 Results

7.5.1 Data analysis

A series of hierarchical regression analyses were undertaken to test the hypotheses that anxious attachment style, excessive reassurance-seeking, and brooding separately predict dependent interpersonal event stress and chronic interpersonal stress (but not independent event stress), which were criterion variables in the hierarchical regression models. In each of the hierarchical regression models, depression status (current MDE and past MDE) was entered at step 1 (these were two dichotomous variables which indicated the presence or absence of a current major depressive episode and past major depressive episodes)³, in order to test the basic stress generation effect, and gender was entered at step 2 as a control variable. The study independent variables were then separately entered at step 3 in each hierarchical regression analysis. A square root transformation was undertaken to address positive

skew in the life event stress variables (section 7.7, Appendix A).

7.5.2 Preliminary analyses

Table 7.1 presents the correlations between the key variables. The Time 1 measures of depression status (current MDE, not past MDE), brooding, anxious attachment style and excessive reassurance-seeking were all significantly positively correlated with dependent interpersonal event stress, assessed at Time 2. Time 1 brooding was correlated with dependent interpersonal event stress and interpersonal chronic stress assessed at Time 2. Neither Time 1 brooding nor any of the Time 1 interpersonal variables were correlated with independent event stress. Gender was not statistically significantly correlated with dependent interpersonal event stress, chronic interpersonal stress, or independent event stress⁴.

Table 7.1

Intercorrelations Between Dependent Interpersonal Event Stress, Chronic Interpersonal Stress and Independent Event Stress, Rumination and Key Interpersonal Variables

	1	2	3	4	5	6	7	8	9	10
1. Dep_Int	-	.13	.04	.24*	.20	.09	.27*	.29**	.07	.36**
2. Chron_Int		-	.21*	.20	.13	.09	.35**	.12	.11	.19
3. Ind			-	.12	.01	-.02	-.08	-.07	-.02	.18
4. T1 MDE				-	.42***	.01	.50***	.34***	.37	.34***
5. Past MDE					-	-.02	.61***	.47***	.37**	.28**
6. Gender						-	.03	-.01	.02	-.05
7. T1 Brood							-	.46***	.40***	.44***
8. T1 ECR-Anx								-	.60***	.45***
9 ECR-Avoid									-	.25*
10. T1 DIRI-ERS										-

Note. $n = 80 - 103$ due to missing data

Dep_Int = dependent interpersonal event stress, Chron_Int = chronic interpersonal stress, Ind = independent event stress, T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, Brood = Brooding sub-scale of the RRS, T1 ECR-Avoid = Time 1 Avoidance sub-scale of the ECR, T1 ECR-Anx = Time 1 Anxiety sub-scale of the ECR, T1 DIRI-ERS = DIRI Excessive reassurance seeking sub-scale = excessive reassurance-seeking sub-scale of the DIRI

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

7.5.3 Do anxious attachment style, excessive reassurance seeking and brooding independently predict dependent interpersonal event stress?

In the first hierarchical regression model, current depression status, past history of depression and gender were entered at step 1, as control variables (Table 7.2). The anxious and avoidant attachment measures were entered at step 2 and dependent event stress was the criterion variable. Adding depression status (current MDE and past MDE) at step 1 significantly improved the hierarchical regression model, $\Delta R^2 = .12, p < .05, F(3, 78) = 3.57, p < .05$. Current MDE was a significant predictor of dependent interpersonal event stress, $\beta = .78, t(78) = 2.35, p < .05$, replicating the stress generation effect. Neither Past MDE nor gender were non-significant predictors of interpersonal event stress (Past MDE, $\beta = .24, t(78) = .83, p = .41$ gender, $.37, t(78) = 1.34, p = .19$). Adding the time 1 insecure attachment style measures at step 2 significantly improved the model, $\Delta R^2 = .07, p < .05, F(5, 76) = 3.65, p < .01$. Anxious attachment style but not avoidant attachment style was a significant predictor of dependent event stress (Anxious attachment style, $\beta = .28, t(76) = 2.52, p < .05$, Avoidant attachment style, $\beta = -.08, t(76) = -.59, p = .56$).

We ran an equivalent model in which step 1 was the same as that described above (with slightly different coefficients obtained at step 1 due to differing n , the result of missing data). In this second model we substituted time 1 excessive reassurance seeking as the independent variable at step 2. Adding excessive reassurance-seeking at step 2 significantly improved the model, $\Delta R^2 = .07, p < .05, F(4, 83) = 4.53, p < .01$. Excessive reassurance-seeking was a significant predictor of dependent event stress, $\beta = .07, t(83) = 2.59, p < .05$.

We ran a third hierarchical regression model in which step 1 was the same as that described above. In this model we substituted brooding as the independent

variable at step 2⁵. Adding time 1 brooding at step 2 did not significantly improve the model, $\Delta R^2 = .02$, $p = .23$, $F(4, 83) = 3.05$, $p < .05$. Brooding was a non significant predictor of dependent event stress, $\beta = .05$, $t(83) = 1.21$, $p = .23$

Table 7.2

Summary of Hierarchical Regression Analyses (final step) Predicting Dependent Interpersonal Event Stress

<i>Step</i>	<i>Predictor</i>	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 3	T1 MDE	.69	2.10	.14	.07*	76
	Past MDE	-.09	-.27			
	Gender	.34	1.26			
	T1 ECR-Anx	.28	2.52*			
	T1 Avoid	-.08	-.59			
Step 3	T1 MDE	.63	2.05	.14	.07*	83
	Past MDE	.02	.06			
	Gender	.39	1.49			
	T1 DIRI-ERS	.07	2.59*			
Step 3	T1 MDE	.66	2.04	.09	.02	83
	Past MDE	-.06	-.17			
	Gender	.38	1.41			
	T1 Brood	.05	1.21			

Note. T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 ECR-Anx = Time 1 Anxiety sub-scale of the ECR, T1 ECR-Avoid = Time 1 Avoidance sub-scale of the ECR, T1 DIRI-ERS = Time 1 Excessive reassurance-seeking, T1 Brood = Time 1 brooding sub-scale of the RRS.

* $p < .05$, ** $p < .01$

7.5.4 Do anxious attachment style and excessive reassurance seeking jointly predict dependent interpersonal event stress or is the effect of one mediated by the other?

To test whether time 1 anxious attachment style and time 1 excessive reassurance-seeking were independent predictors of dependent interpersonal event stress, or whether the effect of one was mediated by the other, we calculated a fourth hierarchical regression model replicating step 1 (as previously specified) and entering

anxious attachment style and excessive reassurance-seeking simultaneously at step 2. Adding anxious attachment style and excessive reassurance significantly improved the model, $\Delta R^2 = .10, p < .05, F(5, 76) = 4.18, p < .01$. In this model, the relationship between time 1 anxious attachment style and dependent interpersonal event stress was approaching statistical significance, $\beta = .20, t(76) = 1.93, p = .06$, whereas the relationship between time 1 excessive reassurance-seeking and interpersonal event stress was not statistically significant, $\beta = .04, t(76) = 1.57, p = .12$ (see Table 7.3).

Table 7.3

Anxious Attachment Style Mediates the Effect of Excessive Reassurance Seeking on Dependent Interpersonal Event Stress

Step	Predictor	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	df
Step 3	T1 MDE	.60	1.87	.16	.10*	76
	Past MDE	-.12	-.39			
	Gender	.33	1.24			
	T1 Anxiety	.20	1.93			
	T1 ERS	.04	1.57			

Note. T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 Anxiety = Time 1 Anxiety sub-scale of the ECR, T1 ERS = Time 1 Excessive reassurance-seeking

* $p < .05$, ** $p < .01$

Consistent with Baron and Kenny's (1986) criteria for mediation, both anxious attachment style and excessive reassurance-seeking predict the criterion variable of dependent interpersonal event stress (Table 7.2), are correlated with each other (Table 7.1), and excessive reassurance-seeking is no longer a significant predictor of dependent interpersonal event stress when the effect of anxious attachment style is statistically controlled (Table 7.3). Using a non-parametric bootstrapping approach (Preacher and Hayes, 2004), the true indirect effect of excessive reassurance-seeking on interpersonal event stress through shared variance with the anxious attachment

style was estimated to lie between .003 and .043 with 95% confidence. Because 0 was not within the 95% confidence interval, these findings suggest that the indirect effect of excessive reassurance-seeking on interpersonal event stress through its relationship with the anxious attachment style was significantly different from 0 at $p < .05$, and indicated that anxious attachment style mediated the relationship between excessive reassurance-seeking and interpersonal event stress.

7.5.5 Do insecure attachment styles, excessive reassurance-seeking (ERS) and brooding predict chronic interpersonal stress?

The next set of analyses replicate those described previously but substituted the measure of chronic interpersonal stress as the criterion variable (Table 7.4). When chronic interpersonal stress was the criterion variable, adding depression status (current MDE and past MDE) and gender at step 1 did not significantly improve the hierarchical regression model, and the overall model was not statistically significant $F(3, 78) = 1.26, p = .30$. Neither current depression status, past history of depression nor gender were significant predictors of chronic interpersonal stress at step 1 (current MDE, $\beta = .98, t(78) = 1.25, p = .22$, past MDE, $\beta = .50, t(78) = .71, p = .48$, gender, $\beta = .51, t(78) = .79, p = .43$).

Adding the Time 1 insecure attachment styles at step 2 did not significantly improve the model, $\Delta R^2 = .003, p = .91, F(5,76) = .78, p = .29$. Neither anxious attachment style nor avoidant attachment style were significant predictors of chronic interpersonal stress (anxious attachment style, $\beta = .04, t(76) = .15, p = .88$, avoidant attachment style, $\beta = .09, t(76) = .28, p = .78$). When we added time 1 excessive reassurance-seeking at step 2 in place of the attachment style variables, a similar pattern of results was obtained: Adding this variable did not improve the model, $\Delta R^2 = .02, p = .20, F(4,83) = 1.57, p = .21$. Time 1 excessive reassurance-seeking was not

a significant predictor of chronic interpersonal stress, $\beta = .08$, $t(83) = 1.28$, $p = .20$. However, when brooding was added at step 2 a different pattern of results emerged⁶. Adding Time 1 brooding significantly improved the hierarchical regression model, $\Delta R^2 = .09$, $p < .01$, $F(4,83) = 3.43$, $p < .05$. Brooding was a significant predictor of chronic interpersonal stress, $\beta = .26$, $t(83) = 2.95$, $p < .01$.

Table 7.4

Summary of Hierarchical Regression Analyses (final step) Predicting Chronic Interpersonal Stress

<i>Step</i>	<i>Predictor</i>	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 3	T1 MDE	.91	1.12	-.01	.003	76
	Past MDE	.37	.48			
	Gender	.48	.73			
	T1 Anxiety	.04	.15			
	T1 Avoidance	.09	.28			
Step 3	T1 MDE	.97	1.32	.03	.02	83
	Past MDE	.21	.31			
	Gender	.50	.80			
	T1 DIRI-ERS	.08	1.28			
Step 3	T1 MDE	.62	.86	.10	.09**	83
	Past MDE	-.84	-1.09			
	Gender	.39	.65			
	T1 Brood	.26	2.95**			

Note. T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 Anxiety = Time 1 Anxiety sub-scale of the ECR, T1 Avoidance = Time 1 Avoidance sub-scale of the ECR, T1 DIRI-ERS = Time 1 Excessive reassurance-seeking, T1 Brood = Time 1 brooding sub-scale of the RRS.

** $p < .01$

7.5.6 Do brooding, anxious attachment styles, and excessive reassurance-seeking (ERS) predict independent event stress?

When independent event stress was the criterion variable, adding depression status (current MDE and past MDE) and gender at step 1 did not significantly improve the hierarchical regression model, and the overall model was not statistically

significant $F(3,78) = .25, p = .86$. Neither current MDE, past MDE nor gender were significant predictors of independent event stress at step 1 (current MDE, $\beta = .31, t(78) = .86, p = .39$ past MDE, $\beta = -.08, t(78) = -.25, p = .80$, gender, $\beta = .01, t(78) = .04, p = .97$). None of the time 1 independent variables added in separate regressions at step 2 (anxious attachment styles, excessive reassurance-seeking and brooding) were significant predictors of independent stress, after statistically controlling for depression status and ongoing interpersonal stress (all $\beta < .20, t's < 2$).

7.6 Discussion

The current study tested the following three main hypotheses: we predicted that a) anxious attachment style, b) excessive reassurance-seeking and c) brooding will prospectively predict increased dependent interpersonal event stress and chronic interpersonal stress, but not independent event stress, controlling for depression status (current major depression and past history of depression) and gender. We were also interested in investigating possible inter-dependence between these variables predicting interpersonal stress.

The study findings were partially consistent with our stated hypotheses. First, we replicated the stress generation finding, with current major depression predicting increased level of dependent interpersonal stress. As predicted, both the anxious attachment style and excessive reassurance-seeking independently predicted increased dependent interpersonal event stress (although, contrary to our stated predictions, neither predicted chronic interpersonal stress), and the effect of excessive reassurance-seeking on dependent interpersonal event stress was mediated by anxious attachment. Contrary to our predictions, rumination (brooding) did not predict dependent interpersonal event stress, although brooding did predict chronic interpersonal event stress. Consistent with the stress generation hypothesis, neither

current depression status, past depression status, anxious attachment style, excessive reassurance seeking nor brooding predicted independent event stress.

The current study extends previous findings which indicated that anxious attachment style and excessive reassurance-seeking predict increased interpersonal stress (Hankin, et al., 2005; Potthoff, et al., 1995) by replicating these results in a heterogeneous community sample that included clinically depressed and previously depressed individuals, whilst using a contextual interview to assess stress. Thus, the current findings provide confirmation that excessive reassurance-seeking and anxious attachment are vulnerability factors for stress generation, using a more conservative design. Moreover, the present study findings revealed that the effect of excessive reassurance-seeking on subsequent interpersonal stress may be dependent on its association with the anxious attachment style. Shaver, et al. (2005) argued that excessive-reassurance seeking is most usefully conceptualised as a facet of anxious attachment style. Consistent with this hypothesis, Shaver, et al. (2005) found that excessive reassurance-seeking was no longer a significant predictor of depression after controlling for anxious attachment. The present finding that excessive reassurance-seeking was no longer a predictor of dependent event stress after controlling for anxious attachment style lends further support to this conceptualisation of excessive reassurance-seeking as a facet of the overarching anxious attachment style.

In contrast to the present findings, Bottonari, et al. (2007) found no main effect of anxious attachment style predicting dependent interpersonal event stress. This discrepancy might reflect differences in sample composition. Whereas the majority of those who participated in the current study were not currently depressed (less than one third met criteria for a current MDE), Bottonari, et al.'s (2007) findings

were based on a sample of clinically depressed individuals undergoing a group behavioural treatment. As predicted, avoidant attachment did not predict increased dependent interpersonal event stress or chronic interpersonal stress in the current study. This finding is consistent with the hypothesis that those with avoidant attachment patterns may avoid interpersonal contact and distance themselves from challenging interpersonal situations (Bottonari, et al., 2007).

To the best of our knowledge, this is the first study to investigate the stress generation effect of brooding using a contextual threat method that enables the objective assessment of life stress, and which minimizes negative reporting bias. The results raise the interesting possibility that different mechanisms might be implicated in the generation of serious interpersonal events (e.g., separation and serious arguments) and ongoing chronic stressors (e.g., relationship friction and lack of social support), and raise the question of why rumination triggers chronic stress and excessive reassurance seeking fuels discrete life events. It is important to note that high chronic stress scores can indicate either lack of social support and/or highly conflictual and problematic relationships. In contrast, the majority of dependent interpersonal stress events are conflict events (Hammen, 1991). Thus, we speculate that rumination may prevent individuals from asserting their needs in relationships (Nolen-Hoeksema & Lyubomirsky, 2008), thus brooding might differentially contribute to chronic interpersonal stress rather than discrete interpersonal stress by fuelling conflict avoidance, rather than by directly inflaming conflict. Consistent with this argument, bereaved ruminators reported decreased social support compared to those without a ruminative coping style (Nolen-Hoeksema & Davis, 1999).

Brooding might maintain chronic interpersonal stress, rather than trigger stressful interpersonal events, because it reduces motivation and inhibits problem

solving skills necessary to overcome difficult ongoing circumstances. Thus, Nolen-Hoeksema, et al. (1999, p.1069) propose that rumination ‘drains people of the motivation, persistence and problem solving skills to change their situations’, which is likely to contribute to ongoing chronic stress. Given that such initiative is necessary for conflict negotiation (Joiner, 2000), this suggests that brooding might create a context in which interpersonal problems are able to fester and grow, rather than directly contributing to the generation of episodic conflict events, such as indexed by dependent interpersonal stress.

We note that one difference between the passive avoidance characteristic of rumination and the avoidance coping which has been found to predict dependent interpersonal stress (Holahan, et al., 2005) is that avoidance coping also included ‘emotional discharge’, a strategy defined as ‘behavioural attempts to reduce tension by expressing negative feelings’ (p. 660, e.g., ‘yell or shout or let off steam’). Whilst different from excessive reassurance-seeking in content, this behaviour shares with it a focus on expressing feelings that are likely to provoke a response from others. Thus, it may be that interpersonal behaviour (such as repeatedly seeking reassurance) which directly impinges on another individual and his or her emotional responses may be necessary for an impact on dependent interpersonal events that mainly involve interpersonal conflict (e.g., Hammen, 1991, Daley, et al., 1997; Davila, et al., 1995). This analysis would explain why brooding, which does not necessarily lead to active behaviours that impinge on another, may not directly lead to increased stress for dependent interpersonal events, although its passive effects could contribute to chronic stress.

The finding that past history of depression did not predict interpersonal stress contrasts to some previous findings which showed that past history of major

depression predicted interpersonal stress (e.g., Shih & Eberhart, 2008) but is consistent with other previous findings that did not replicate this stress generation effect of past depression (e.g., Safford, Alloy, Abramson, & Crossfield, 2007). Of relevance to understanding these results, Safford, et al. (2007) hypothesised that past depression only predicts stress generation when the past episode of major depression is relatively recent rather than remote. Moreover, Shih and Eberhart (2008) found that the effect of prior depression status on predicting subsequent stress was mediated by the level of depressive symptoms. Given that nearly half ($n = 18$) of the participants with past major depression in the current study had not experienced an episode of major depression within the past year, our findings are consistent with this hypothesis that only recently remitted depression associated with residual symptoms predicts stress generation.

Some limitations with the current study should be noted. First, the study only employed two time points, which clearly represents a simplification of the stress generation process. Second, given the relatively small proportion of variance in interpersonal stress explained by the variables in our study, it is possible that other variables not included in our analyses also contribute to explaining the stress generation phenomenon. Third, because we did not have a measure of prior chronic stress (unfortunately, it was not feasible to administer the life stress interview during the baseline assessment), this leaves open the possibility that the effect of brooding on chronic stress might not have been maintained if we had controlled for prior chronic stress (this result warrants replication controlling for prior chronic stress). Fourth, we note that as a longitudinal prospective design, this study can only determine the temporal precedence of one variable predicting another, and cannot establish causal direction, for which a direct manipulation of independent variables is required.

Nonetheless, key strengths of the study design were utilisation of a contextual threat interview, which enabled a rigorous and systematic assessment of stress that takes account of the individual meanings associated with interpersonal events; a longitudinal design enabling assessment of the prospective relationship between cognitive and interpersonal mechanisms and interpersonal stress over a six month period, and use of a mixed gender heterogeneous community sample, increasing generalisability of the findings.

The study findings have potential clinical implications. First, the findings suggest that when clinicians undertake assessment work with individuals vulnerable to depression, it may be helpful to investigate the role of anxious attachment style, excessive reassurance seeking and brooding as potential mechanisms of interpersonal stress generation. Second, the study findings raise the possibility that cognitive and interpersonal interventions that target brooding (e.g., Watkins, et al., 2007), insecure attachment style and excessive reassurance-seeking (e.g., schema therapy and interpersonal psychotherapy) might increase resilience to prevent depression recurrence by inhibiting harmful stress generation, enhancing social functioning, and improving relationship quality. However, further research involving the manipulation of brooding and excessive reassurance-seeking via experimental means or clinical intervention is required to more fully investigate this possibility.

In conclusion, this study provided the first examination of whether rumination (brooding) predicts stress generation, and the first test using a contextual interview in a community adult sample of whether anxious attachment and excessive reassurance-seeking predict stress generation. The findings extend our understanding of the cognitive and interpersonal factors which contribute to stress generation: A cognitive factor, brooding, predicted chronic interpersonal stress, whereas interpersonal factors,

and in particular, anxious attachment style, predicted dependent interpersonal event stress. Moreover, anxious attachment style mediated the effect of excessive reassurance-seeking on future dependent interpersonal event stress.

Footnotes

¹ We replicated the analyses reported in the current study using a dataset in which the two dysthymic participants were excluded and obtained the same pattern of regression coefficients was obtained using the full dataset.

² We replicated the analyses reported in the current study using measures of dependent interpersonal event stress and independent event stress which included 1 impact events as criterion variables. The same pattern of regression coefficients was obtained.

³ We replicated the hierarchical regression models substituting level of depressive symptoms (Beck Depression Inventory, BDI, score) for diagnostic status (Current MDE and Past MDE). Adding BDI at step 1 significantly improved the model, $\Delta R^2 = .12, p < .001, F(1, 84) = 11.38, p < .001$. Time 1 BDI was a significant predictor of dependent interpersonal event stress, $\beta = .03, t(84) = 3.37, p < .001$. Time 1 BDI was a significant predictor of chronic interpersonal stress, $\beta = .05, t(84) = 2.45, p < .05$. Time 1 BDI was approaching statistical significance as a significant predictor of independent event stress, $\beta = .02, t(84) = 1.96, p = .05$.

⁴ To test whether gender moderated the effect of rumination on stress, we ran the hierarchical regression model including the interaction term brooding x gender. The interaction term was a non significant predictor of dependent interpersonal event stress and chronic interpersonal stress.

⁵ We replicated the hierarchical regression model with dependent interpersonal event stress as the criterion variable, entering the total rumination score at step 3. Adding rumination at step 3 did not significantly improve the model, although the overall model remained statistically significant, $F(4, 83) = 2.98, p < .05$. Rumination was a non-significant predictor of interpersonal event stress, $\beta = .01, t(83) = 1.11, p = .27$.

We conducted another hierarchical regression model entering reflection at step 3. Adding reflection at step 3 did not significantly improve the model, although the overall model remained statistically significant, $F(4, 83) = 3.05, p < .05$. Reflection was a non-significant predictor of interpersonal event stress, $\beta = .05, t(83) = 1.22, p = .23$.

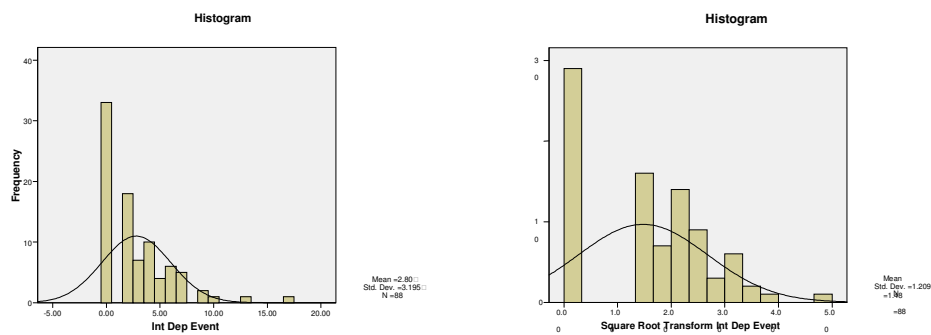
⁶ We replicated the hierarchical regression model with chronic interpersonal stress as the criterion variable entering the total rumination score at step 3. Adding rumination at step 3 did not significantly improve the model, and the overall model was not statistically significant, $F(4, 83) = 1.96, p = .11$. Rumination was approaching significance as a predictor of chronic interpersonal stress, $\beta = .05, t(83) = 1.77, p = .08$. We conducted another hierarchical regression model entering reflection at step 3. Adding reflection at step 3 did not significantly improve the model, and the overall model was not statistically significant, $F(4, 83) = 1.39, p = .24$. Reflection was a non-significant predictor of chronic interpersonal stress, $\beta = .10, t(83) = .13, p = .33$.

7.7 Appendix A: Square root transformation of the event stress variables

Although it is not a requirement for hierarchical regression analyses that variables are normally distributed (Tabachnick & Fidell, 2007), skewed data can be problematic when this results in cases with large residuals (> 3). Therefore, because it was detected in the preliminary hierarchical regression model, in which the interpersonal dependent event variable was the criterion variable, that there was one outlier (i.e., case which generated a standardized residual > 3) and because the interpersonal dependent event data was significantly positively skewed, $z_{\text{skewness}} = 6.62, p < .001$, and leptokurtic, $z_{\text{kurtosis}} = 8.20, p < .001$,) a square root transformation was undertaken which addressed this issue. The square root transformed variable was not significantly different from the normal distribution, $z_{\text{skewness}} = .75, p = \text{n.s.}$, $z_{\text{kurtosis}} = -1.30, p = \text{n.s.}$

Figure 7.2

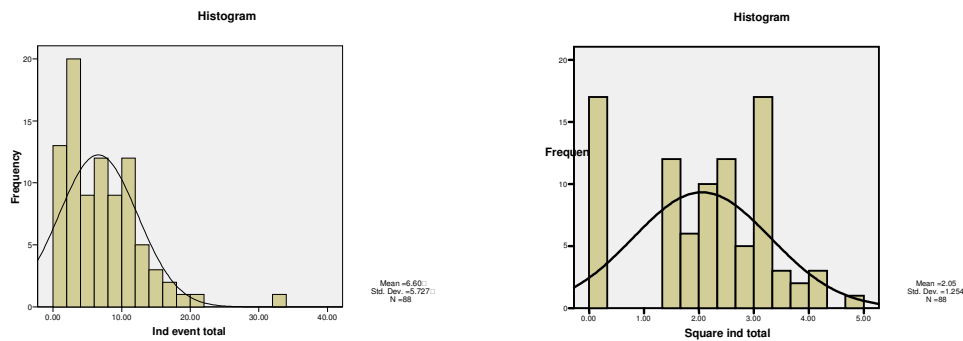
Distribution of the Interpersonal Dependent Event Variable Before and After Square Root Transformation



Similarly, because it was detected in the preliminary hierarchical regression model, in which the independent event variable was the criterion variable, that there was one outlier (i.e., case which generated a standardized residual > 3) and because the independent event data was significantly positively skewed, $z_{\text{skewness}} = 5.60, p < .001$, and leptokurtic, $z_{\text{kurtosis}} = 7.87, p < .001$,) a square root transformation was undertaken which addressed this issue. The square root transformed variable was not significantly different from the normal distribution, $z_{\text{skewness}} = -.120, p = \text{n.s.}$, $z_{\text{kurtosis}} = -1.24, p = \text{n.s.}$

Figure 7.3

Distribution of the Interpersonal Independent Event Variable Before and After Square Root Transformation



7.8 Appendix B: Bi-directional relationship between brooding and poor social adjustment

A further set of analyses investigated the bi-directional relationship between rumination and poor social adjustment (a further index of adverse interpersonal consequences), as assessed using the Social Adjustment Scale-Self-Report (SAS-SR, Weissman, 1999). The SAS-SR is a 54 item self-report questionnaire which assesses instrumental (individual adaptation within society and what one does in the world) and expressive (maintenance of interpersonal relations among members of social group, how one relates to others in the world) role performance over the past two weeks.

Six main areas of functioning are covered: work; social and leisure activities; relationships with extended family; role as a marital partner; parental role; and role within the family unit. The questions cover the categories of performance at expected tasks, interpersonal conflict, and other aspects of interpersonal relations, feelings, and satisfaction. Questions are rated on a 5-point scale with higher scores indicating more problems with social adjustment. An overall adjustment score is obtained by summing the scores of all items (from each of the six sub-scales/domains that comprise the total measure) and dividing by the number of items answered (i.e., mean score). In this study the SAS-SR sub-scales demonstrated an acceptable level of internal consistency (T1 $\alpha = .68 - .84$). The combined average score, computed using items across all of the SAS-SR sub-scales/domains, was used (rather than conducting six separate hierarchical regression analyses using domain specific average scores as criterion variables) because: a) it was hypothesised that rumination would be associated with impaired social adjustment across each all of the domains, b) this was a more parsimonious analysis, i.e. with reduced risk

of type II error associated with conducting multiple analyses). Demonstrating that rumination prospectively predicts diminished relationship satisfaction, chronic interpersonal stress and poor social adjustment provides robust evidence that rumination generates adverse interpersonal consequences. Moreover, because the SAS-SR was included as the primary index of adverse interpersonal consequences in study 6 (it was not viable to include the more time consuming and labor intensive life stress interview in study 6 due to participant burden), it was necessary to first demonstrate that rumination prospectively predicts diminished social adjustment in this preliminary study.

In the first hierarchical regression model, the baseline measure of social adjustment, depression status (currently depressed and past history of depression) and gender were entered at step 1 as control variables, and Time 1 brooding was entered at step 2. Time 2 social adjustment was the criterion variable. When Time 1 social adjustment, depression status, and gender were entered at step 1 this significantly improved the model and the overall model was statistically significant, $\Delta R^2 = .41, p < .001, F(4,84) = 14.63, p < .001$. Adding Time 1 brooding at step 2 further improved the model, $\Delta R^2 = .06, p < .01, F(5,83) = 15.04, p < .001$, and time 1 brooding was a significant predictor of time 2 social adjustment, $\beta = .05, t(83) = 3.20, p < .01$. (Equivalent hierarchical regression models were run in which rumination and reflection were substituted for brooding. Rumination was approaching statistical significance as a predictor of Time 2 social adjustment, $\beta = .01, t(83) = 1.99, p = .05$. Reflection was not a significant predictor of Time 2 social adjustment, $\beta = -.003, t(83) = -.20, p = .84$.)

In the second hierarchical regression model, the baseline measure of brooding, depression status (currently depressed and past history of depression) and gender were

entered at step 1 as control variables and Time 1 social adjustment was entered at step 2, with Time 2 brooding as the criterion variable. When Time 1 brooding, depression status, and gender significantly were entered at step 1, this significantly improved the model and the overall model was statistically significant, $\Delta R^2 = .42, p < .001, F(4,86) = 15.33, p < .001$. Adding Time 1 social adjustment at step 2 did not improve the model, $\Delta R^2 = .02, p = .09, F(5, 85) = 13.12, p < .001$. Time 1 social adjustment was not a significant predictor of Time 2 brooding, $\beta = 1.25, t(85) = 1.71, p = .09$. (Neither did baseline social adjustment predict rumination, $\beta = 2.64, t(85) = .91, p = .37$, or reflection, $\beta = .68, t(85) = .96, p = .34$).

Table 7.5

Summary of Hierarchical Regression Analyses (final step) Predicting Poor Social Adjustment

<i>Step</i>	<i>Predictor</i>	<i>B</i>	<i>T</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 3	T1 SAS-SR	.35	3.13	.44	.06	83
	T1 MDE	.20	1.45			
	Past MDE	.01	.08			
	Gender	-.21	-2.01			
	T1 Brooding	.05	3.20**			

Note. T1 SAS-SR = Social adjustment scale – self-report T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 Brood = Time 1 brooding sub-scale of the RRS. * $p < .05$, ** $p < .01$

Table 7.6

Summary of Hierarchical Regression Analyses (final step) Predicting Brooding

<i>Step</i>	<i>Predictor</i>	<i>B</i>	<i>T</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 3	T1 Brood	.51	5.06	.44	.02	85
	T1 MDE	.26	.29			
	Past MDE	.06	.07			
	Gender	.67	.99			
	T1 SAS-SR	1.25	1.71			

Note. T1 SAS-SR = Social adjustment scale – self-report T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 Brood = Time 1 brooding sub-scale of the RRS. * $p < .05$, ** $p < .01$

7.9 Appendix C: Chronic stress predicts rumination

A supplementary analysis was undertaken to evaluate whether chronic stress (assessed over the study duration) prospectively predicted increased rumination (brooding) at time 2, controlling for time 1 rumination, depression status and gender. This supplementary analysis was planned to test the prediction that the relationship between rumination and chronic strain is bi-directional in nature (i.e., to assess whether chronic strain is both an interpersonal antecedent and consequence of rumination. Nolen-Hoeksema, et al. (1999) hypothesised (and found, in a large community sample, $N = 1,100$) that chronic strain and rumination have reciprocal effects on one another. (chronic strain is a conceptually similar measure to the measure of chronic stress employed in the current study which assessed lack of affirmation in close relationships, role burden, housework inequities childcare inequities and other parenting strains on the basis of numbers of hours worked). They proposed that chronic strain will fuel rumination as depression vulnerable individuals (often women) seek out ways to control their

environment, whilst lacking the necessary self-efficacy to do so.

Having partially replicated these previous results by demonstrating that rumination predicts increased chronic strain this additional analysis tested the opposite direction of relationship. The baseline measure of brooding, depression status (currently depressed and past history of depression) and gender were entered at step 1 as control variables, and chronic interpersonal stress was entered at step 2. Time 2 brooding was the criterion variable. When Time 1 brooding, depression status, and gender were entered at step 1 this significantly improved the model and the overall model was statistically significant, $\Delta R^2 = .36, p < .001, F(4,83) = 11.87, p < .001$. Adding chronic interpersonal stress at step 2 further improved the model, $\Delta R^2 = .03, p = .05, F(5, 82) = 10.63, p < .001$, and chronic interpersonal stress was approaching statistical significance as a predictor of time 2 social adjustment, $\beta = .25, t(82) = 1.99, p = .05$. Thus, providing some support for the prediction that there is a reciprocal relationship between rumination and chronic strain, chronic strain did explain additional variance (3%, $p = .05$) in time 2 brooding. However, the other direction of relationship, whereby brooding predicted chronic strain, was more reliably supported (9% variance explained, $p < .01$).

7.10 Appendix D: Maladaptive interpersonal styles predict interpersonal stress

A further set of supplementary analyses investigated whether the maladaptive submissive, needy and cold interpersonal styles predicted increased dependent interpersonal event stress. This supplementary analysis was conducted in order to assess whether the stress generation effect of maladaptive needy interpersonal behaviours such as excessive reassurance-seeking (encapsulated in the needy interpersonal style) might be

better explained as a generic stress generation effect of maladaptive interpersonal behaviour. Consistent with the prediction that needy interpersonal behaviours, rather than maladaptive interpersonal style more generally, are implicated in stress generation, only the needy interpersonal style predicted increased dependent interpersonal event stress, $\beta = .34, t(77) = 2.29, p < .05$ (Table 7.7).

Table 7.7

Summary of Hierarchical Regression Analyses (final step) Maladaptive Interpersonal Styles Predicting Dependent Interpersonal Event Stress

<i>Step</i>	<i>Predictor</i>	<i>B</i>	<i>t</i>	R^2_{adj}	ΔR^2	<i>df</i>
Step 3	T1 MDE	.72	2.09	.16	.07	77
	Past MDE	-.03	-.09			
	Gender	-.32	-1.14			
	T1 Submissive	-.09	-.60			
	T1 Cold	-.16	-.97			
	T1 Needy	.34	2.29*			

Note. T1 MDE = Time 1 current major depressive episode. Past MDE = Past history of major depressive disorder, T1 Submissive = submissive interpersonal style, T1 Cold = Cold interpersonal style, T1 Needy = Needy interpersonal style

** $p < .05$

CHAPTER 8: Concreteness training reduces rumination and submissive interpersonal behaviour in a depressed sample

8.1 Preface

In previous chapters, the concurrent and prospective relationship between rumination, specific maladaptive interpersonal styles and poor social adjustment was empirically tested (chapters 3-7). Consistent with theoretical models which indicate that rumination fuels adverse interpersonal consequences (Lyubomirsky & Tkach, 2004; Tse & Bond, 2004), the results described indicate that rumination prospectively predicts diminished relationship satisfaction (Chapter 3), poor social adjustment, and increased chronic interpersonal stress (both Chapter 7). The relationship between rumination and the maladaptive interpersonal style remains somewhat less clear: in Chapter 4 it was found that, after controlling for other interpersonal styles (needy and cold), rumination is specifically associated concurrently with a submissive interpersonal style. However, in a follow-up study, (Chapter 6) rumination did not prospectively predict increased submissive behaviours, after controlling for depression.

The aim of this final study (study 6, sample 3) was to evaluate whether rumination is causally implicated in poor social adjustment and the submissive interpersonal style, via the experimental manipulation of rumination. To that end, a novel methodology was employed in which rumination was manipulated via a cognitive intervention (concrete training, CT, see section 8.4.4 for further details), which consisted of an extended experimental manipulation lasting six weeks. This approach provided a proof of principle test of whether an intervention that specifically targets rumination influences social adjustment and submissive interpersonal behaviour. A uni-directional

manipulation (i.e., a manipulation designed to reduce rumination versus a treatment-as-usual control and another intervention, relaxation training (see section 8.4.4 for more details) was employed because it would be unethical to employ an extended manipulation which involved increasing rumination.

All those in the current study sample ($N = 79$ adults) met DSM-IV criteria for a current major depressive disorder, with depressive symptoms at least 8 on the Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960; Williams, 1988) and 14 on the Beck Depression Inventory (BDI; Beck, et al., 1996). Participants were recruited from GP services across the Devon area. Thus, the sample is representative of presentations of major depression as seen in primary care. Because the larger treatment trial, of which this study formed a satellite study, was ongoing at the point of conducting the analyses reported in this chapter, this represents a sub-set of the sample (i.e., those included in the present study were the total participants for whom baseline and first follow up data was available by November 2009). Further analyses using the complete randomized controlled trial (RCT) dataset will be re-run following the trial completion.

The RCT was funded by the Medical Research Council and had full NHS ethics approval. I was one of a team of four research officers responsible for recruitment, assessment and delivery of the concrete training (CT) and relaxation training (RT) interventions. My involvement included responsibility for liaison with one local GP practice (Okehampton), to identify and contact potential participants (identified by running a search of the practice database), preliminary telephone screening of potential participants (26 telephone screenings conducted), conducting baseline assessments (14 baseline assessments conducted), delivery of therapy (CT = 5, RT = 4) and administration

of follow up assessment sessions (Follow up 1 = 10 sessions, FU2 = 8 sessions).

8.2 Abstract

The current study provides an empirical evaluation of theoretical models which indicate that rumination fuels poor social adjustment and submissive interpersonal behaviour in depression. Seventy-nine depressed adults, recruited into a randomized controlled trial, participated in either concreteness training (CT), a cognitive intervention which specifically targeted the cognitive processes underpinning rumination (i.e., rumination manipulation) and two control conditions: treatment as usual (TAU) and relaxation training (RT), an active control condition matched for non specific factors, including a rationale for targeting rumination. Participants completed self-report measures of depressive symptoms, rumination, social adjustment, and maladaptive interpersonal behaviours, at a baseline assessment and again post-intervention (8-10 weeks later). There was a significantly greater reduction in rumination in the CT compared to TAU, $p < .05$ (but not RT conditions, $p = .20$). As predicted, the reduction in submissive interpersonal behaviours was significantly greater in the CT compared to TAU ($p < .05$) and RT conditions (approaching statistical significance, $p = .07$). Contrary to predictions, the change in social adjustment was not greater in the CT compared to TAU or RT conditions. These findings suggest that a psychological intervention which facilitates concrete thinking as an alternative to rumination reduces maladaptive submissive interpersonal behaviour.

Keywords: Rumination, brooding, social adjustment, submissiveness, interpersonal style

8.3 Introduction

Consistent with Nolen-Hoeksema's (1991, 2004) response styles theory (RST), substantive empirical evidence indicates that depressive rumination, defined as repetitively focusing on the symptoms of depression and their causes and meanings (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), is implicated in the onset and maintenance of depression (for reviews see Nolen-Hoeksema, et al., 2008; Watkins, 2008). In contrast to RST, other theories have emphasized the depressogenic role of interpersonal processes such as submissiveness and excessive reassurance-seeking behaviours (Coyne, 1976a, 1976b; Gilbert, Allan, & Trent, 1995; Horowitz & Vitkus, 1986; Joiner, 2000).

More recently, there has been increasing interest in integrating cognitive and interpersonal theories of depression. Thus, Lyubomirsky and Tkach (2004) conceptualised a vicious cycle in which rumination fuels interpersonal difficulties by negatively biasing thinking, impairing effective problem solving and inhibiting motivation and instrumental behaviour. Lyubomirsky and Tkach's (2004) model predicts that rumination is causally implicated in poor social adjustment in depression. They speculate that rumination interferes with functioning at work (e.g., rumination might lead someone to miss a social cue during a business meeting) and impairs partner and familial relationships (e.g., rumination might reduce attentiveness to one's spouse or child). Consistent with this hypothesis, findings reported in the current thesis indicate that rumination prospectively predicts diminished relationship satisfaction (Chapter 3), poor social adjustment, and increased chronic interpersonal stress (Chapter 7).

Converging theory and empirical findings indicate that rumination is specifically

associated with a submissive interpersonal style, because ruminating inhibits motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993; Moulds, Kandris, Starr, & Wong, 2007), and reinforces the perception that one cannot efficaciously assert control over one's environment (Nolen-Hoeksema et al., 2008). Consistent with this hypothesised relationship between rumination and submissive interpersonal style, findings reported in the current thesis indicated that rumination was associated concurrently with increased submissiveness, after statistically controlling for other interpersonal styles (needy and cold interpersonal style) and depression, in a mixed sample of currently depressed, previously depressed and never depressed adults (Chapter 4).

However, rumination did not prospectively predict increased submissiveness in previous analyses reported in the thesis (chapter 5). This finding suggests that rumination is not a temporal antecedent of, and therefore not causally implicated in, increased submissive behaviour. However, an alternative explanation for this unexpected null result could be the high level of stability over time in submissiveness in this previous sample ($r = .87, p < .001$). Because there was no manipulation of rumination or interpersonal style in this previous study, this leaves open the possibility that manipulating rumination could generate variability in submissiveness, enabling a better evaluation of this hypothesised causal link.

The association of rumination with poor social adjustment and maladaptive interpersonal style is not sufficient to demonstrate that rumination plays a causal role in their development and/or maintenance of these interpersonal difficulties. To demonstrate causality, it is necessary to manipulate the independent variable (rumination) and to demonstrate that the dependent variable (social adjustment, maladaptive interpersonal

behaviour) also changes, such that as rumination is reduced, the dependent variable also reduces.

Previous experimental studies which have tested the effects of rumination, compared to distraction, on mood (Nolen-Hoeksema & Morrow, 1993), interpersonal problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999), and performance on cognitive tasks (Lyubomirsky, Kasri, & Zehm, 2003), have used a rumination induction technique developed by Nolen-Hoeksema and Morrow (1993). This procedure involves participants focusing on the meanings, causes, and consequences of their current feelings (e.g., being asked to think about what your feelings might mean), or engaging in a distraction induction designed to divert attention from thinking about meanings, causes, and consequences of their current feelings. The increased rumination generated by this experimental induction only endures for a brief duration (Lyubomirsky & Nolen-Hoeksema, 1995). Thus, whilst this method is adequate for completion of an experimental task, it is clearly not suited to investigating the consequences of rumination outside of the laboratory, and over longer periods of time. To that end, the current study employed a novel methodological approach in which rumination was manipulated via an applied intervention (concreteness training), within the context of a randomized controlled trial.

Concreteness training (see also section 2.2.3) involves depressed individuals actively engaging in generating concrete construals when imagining emotional events (e.g., focusing on the specific contextual details of how an event occurred and thinking about how to proceed next in a detailed step-by-step manner). The intervention is underpinned by empirical evidence which implicates increased use of abstract construals ,

defined as ‘general, superordinate, and decontextualised mental representations that convey the essential gist and meaning of events and actions’ (Watkins, et al. 2009, p. 56), as being a key element that accounts for some negative consequences of rumination (Watkins, 2008). Whereas evidence suggests that abstract construals in the context of positive situations can be beneficial (e.g. Marigolds, Holmes, & Ross, 2007, found that people with low self esteem who thought abstractly about a compliment reported greater state self-esteem than those who were induced to think concretely about the compliment), abstract construals in response to negative events have been found to generate adverse consequences, including increased negative mood and rumination (Moberly and Watkins, 2006; Watkins, 2004; Watkins & Teasdale, 2001). Moreover, disengagement from pursuing abstract goals is deemed to be more difficult (fuelling negative repetitive thought, McIntosh, Harlow, & Martin, 1995) because this type of goal is more likely to be linked to views of self, and because it is more difficult to ascertain when goal attainment has been achieved.

Importantly, in a pilot proof-of-principle study, mild to moderately depressed individuals who engaged in repeated exercises designed to encourage more concrete and specific thinking about emotional events in addition to relaxation training (over a seven day period) reported significantly greater decreases in rumination (and depression) compared to those who engaged in relaxation exercises alone (Watkins & Moberly, 2009). In a follow-up to this study (Watkins, Baeyens, & Read, 2009), concreteness training resulted in significantly greater decreases in rumination (and depression) compared to a waiting list control.

For the purposes of the present study, concreteness training was employed as an

extended experimental manipulation, providing a proof of principle test of whether reducing rumination influences social adjustment and submissive interpersonal behaviour. A uni-directional manipulation was used because it would not be ethical to employ an alternative manipulation which involved increasing rumination. The study included two control conditions (relaxation training, RT, and treatment as usual, TAU). All participants carried on with treatment-as-usual (TAU), which was the current treatment for their depression provided by their GP, which included nothing, watchful waiting, regular support, and antidepressant medication. Participants randomized to the CT and RT conditions received these guided self-help treatments in addition to TAU (i.e., CT+TAU, RT+TAU). The primary comparison of the study was between CT versus TAU because this comparison tests whether the addition of an intervention specifically intended to target rumination (CT) has additional benefit on the dependent variables hypothesised to be associated with rumination (e.g., submissive behaviours), compared to a control condition with no specific intervention targeting rumination. It is hypothesised that CT will significantly reduce rumination relative to TAU, and that rumination is causally implicated in social adjustment and submissive interpersonal behaviours. Thus, the primary predictions were that relative to TAU, the addition of CT will produce a) a significantly greater reduction in rumination (brooding); b) a significantly greater improvement in social adjustment in the CT; c) a significantly greater reduction in maladaptive submissive interpersonal behaviours.

The inclusion of the relaxation training (RT) condition enabled several secondary comparisons. The RT condition involved an active treatment, which has previously been shown to reduce depression (Murphy, Carney, Knesevich, Wetzel, & Whitworth, 1995;

Reynolds & Coats, 1986). Furthermore, the rationale of the RT, like CT, was focused on the reduction of rumination. Moreover, since the RT condition involved practicing the use of progressive relaxation as a coping response to physical warning signs of impending rumination, such as increased tension, narrowing attention, increased heart rate, it is plausible that RT itself would reduce rumination by blocking its build-up, albeit through a different mechanism from CT. Thus, as a secondary analysis, the comparison of CT versus RT may allow an investigation of the active mechanisms influencing rumination (e.g., is it due to non-specific factors or due to the specific mental exercises?). More importantly for the current study, the RT condition potentially allows for the role of any symptom improvement to be controlled for when examining change in social functioning since both CT and RT are expected to reduce depressive symptoms. Thus, inclusion of the RT condition meant that, as a further test of the study hypotheses, we were able to control for any improvement in social adjustment and reduction in maladaptive interpersonal behaviours occurring due to improvement in depressive symptoms (which was predicted to occur to a greater extent in CT compared to TAU, but with an equivalent reduction in depressive symptoms expected in CT and RT) rather than change in rumination (predicted to occur in the CT condition to a greater extent than RT because CT directly targets cognitive processes underpinning rumination).

8.4 Method

8.4.1 Participants

The sample comprised 79 depressed individuals recruited into a randomized controlled trial of cognitive training as a facilitated self-help intervention for depression. This was a sub-set of a sample (follow-up for the main RCT is ongoing at the point of

writing). Those included in the present study were the total participants for whom baseline and first follow up data was available by November 2009. Inclusion criteria included meeting DSM-IV criteria for major depression within the last month, and with depressive symptoms at least 8 on the 17-item Hamilton Rating Scale for Depression (HRSD, Hamilton, 1960; Williams, 1988) and 14 on the Beck Depression Inventory (BDI; Beck, Steer &, Brown, 1996), and being aged 18 years or older.

Exclusion criteria included co-morbid diagnoses of current and significant substance dependence, organic brain damage and current psychosis, bipolar disorder, learning disability, persistent anti-social behaviour, persistent self-injury, being unable to engage with facilitated self-help treatment for physical, practical or other reasons, and currently engaged in formal concurrent face-to-face psychotherapy/counselling.

Demographic characteristics of the baseline sample are presented in Table 8.1.

Table 8.1

Demographic Characteristics of the Sample at Baseline Assessment by Condition

Variable	Condition		
	CT (<i>n</i> = 24)	RT (<i>n</i> = 29)	TAU (<i>n</i> = 26)
Gender (No./%)	12 female (50)	23 female (79.31)	13 female (50)
Age	46.41 (13.46)	45.40 (12.82)	46.16 (12.31)
Past MDEs	3.58 (2.95)	4.10 (3.11)	6.50 (6.02)
No. (%) ADM	12 (50)	12 (41.38)	14 (53.84)
Most common ADM	Citalopram	Citalopram	Citalopram

Note. CT = Concrete training; RT = relaxation training; TAU = treatment as usual; Past MDE = Past Major Depressive Episode; ADM = Anti depressant medication

8.4.2 Randomization protocol

Block randomization (random varying block sizes) to the different treatment

conditions was undertaken by an independent statistician using computer generated quasi-random numbers. The computer-based randomization protocol was set up and administered off-site and independently by the Institute of Psychiatry Clinical Trials Unit. Severity of depression and current antidepressant treatment (whether receiving a therapeutic dose, defined as taking antidepressants for four or more weeks at a minimum daily dose at least equivalent to 125 mg of amitriptyline, within recommended NICE guidelines) was monitored. Randomization was stratified by severity of current depression (mild – HRSD ≤ 17 vs. moderate-to-severe HRSD > 17) and by use of antidepressant medication (at therapeutic dose or no medication/inadequate sub-clinical dose) in order to examine the effects of these factors on outcome.

8.4.3 Medication adherence protocol

The use of antidepressant medication was a continuation of the existing treatment programme. To ensure that treatment, where possible, was in accord with the NICE guidelines for depression (2004) and in line with BNF dosage recommendations, the initial assessment reviewed participant's use of medication (following informed consent but prior to randomization to the different treatment conditions). This process ensured each patient's medication usage was accurately recorded. Where any change in medication use was reported, the participant was required to wait until at least 4 weeks had passed from the alteration in medication before they were allocated to randomisation.

8.4.4 Clinical Interventions

Both the CT and RT interventions involved an initial 1.5 to 2 hour session and three telephone sessions with a trained facilitator, followed by thirty minutes daily practice, over a six week period, using an audio recording to practise their skills. In both

interventions, participants were initially provided with the same explicit rationale for the training which explored how over-generalization (e.g., ‘jumping to conclusions’ and ‘losing perspective’) and rumination was unhelpful and how the training exercises were designed to reduce this unhelpful thinking and, thereby, reduce depression. Participants in both conditions were asked to provide recent examples of when they had engaged in rumination, over-generalization, and inactivity. In this way, the CT and RT conditions were effectively matched for rationale re rumination and for amount of therapist contact.

8.4.5 Concrete Training

In the training session, patients initially worked through a standardized scenario, which involved imagining being in a café waiting to meet somebody, and responding to questions intended to prompt abstract thinking (e.g., think ‘why is this happening to me?’). They then imagined the same scenario again and responded to alternative questions intended to prompt concrete thinking (e.g., think ‘what details do I notice when I concentrate on my experience in the café?’) in order to demonstrate the benefits of thinking more concretely. Participants then practiced the key elements of concrete processing when recalling in imagery one or two personally salient scenarios. Participants were facilitated to engage in concrete processing whilst imagining the scenarios via direct instructions and guiding questions, encouraging them to: a) focus on sensory details in the moment (e.g., questions asked patients to focus on and describe what they could see, hear, feel as they imagined this past event); b) notice what is specific and distinctive about the context of the event; c) notice the process of how events and behaviours unfold (e.g., ‘imagine a movie of how events unfolded’); d) generate detailed step-by-step plans of how to proceed from here.

At the end of the training session, participants were given a digital recording of the concrete training exercises to practice thinking about memories and current problems in a concrete way at home, and an information pack including a daily diary to record their practice. Participants were asked to practice the concrete thinking exercises by listening to the recording daily over a six week period. Patients received three telephone sessions (the first after 1 week and then at 2 week intervals). These sessions monitored progress with the training, reviewed success and difficulties, provided feedback, guidance, and encouragement, and introduced new elements to the training as necessary.

8.4.6 Relaxation Training

In the relaxation training session, participants worked through a guided progressive relaxation procedure in which they practised tensing and relaxing various muscle groups while focusing on slowing their breathing for 30 minutes. At the end of the training session participants were given a digital recording of the relaxation training exercises. Participants were asked to practice the relaxation exercises by listening to the recording daily over a six week period. To ensure that the intervention was matched with CT, participants received three telephone sessions (the first after 1 week and then at 2 week intervals). These sessions monitored progress with the training, reviewed success and difficulties, provided feedback, guidance, and encouragement, and introduced new elements to the training as necessary.

8.4.7 TAU condition

Participants in the TAU condition were asked to continue with their current treatment (e.g., medication, “watchful waiting”) in line with GP recommendations.

8.4.8 Measures

Structured Clinical Interview for DSM-IV: Axis I, (First, Spitzer, Gibbon, & Williams, 1997). In assessing current depression, all symptoms were assessed to enable identification of current diagnostic status and to assess number of past major depressive episodes. Independent ratings of sampled audiotapes of diagnostic interviews were conducted to ensure the reliability of the SCID diagnoses.

Beck Depression Inventory-II (BDI; Beck, et al., 1996). The BDI is a well-validated 21-item self-report questionnaire which measures depressive symptom severity in the past two weeks, with an emphasis on affective and cognitive symptoms. Participants rate their answers using a 0-3 scale with higher scores indicating greater depression severity (range 0-63). Minimal (0-13), mild (14-19), moderate (20-28) and severe (29-63) symptom severity ranges have been specified.

Response Style Questionnaire (RSQ) - Ruminative Responses Scale (RRS; Nolen Hoeksema, 1991; Treynor et al., 2003). The RSQ is a self-report measure which includes a 22 item Ruminative Response Scale (RRS), assessing the tendency to ruminate in response to depressed mood. Participants are asked to rate how often (almost never, sometimes, often, almost always) they think and do different things when feeling down, sad or depressed, e.g., “Think ‘why can’t I get going?’”. Brooding was measured using five items from the RRS scale, e.g., “Think ‘why do I always react this way?’” (BL $\alpha = .78$, FU1 $\alpha = .78$).

The Social Adjustment Scale-Self-Report (SAS-SR, Weissman, 1999). The SAS-SR is a 54 item self-report questionnaire which assesses instrumental (individual adaptation within society and what one does in the world) and expressive (maintenance

of interpersonal relations among members of social group, how one relates to others in the world) role performance over the past two weeks. The SAS-SR has previously demonstrated good internal consistency, concurrent and external validity (Weissman, 1999). Six main areas of functioning are covered: work; social and leisure activities; relationships with extended family; role as a marital partner; parental role; and role within the family unit. The questions cover the categories of performance at expected tasks, interpersonal conflict, and other aspects of interpersonal relations, feelings and satisfaction. Questions are rated on a 5-point scale with higher scores indicating more impairment. An overall adjustment score is obtained by summing the scores of all items and dividing by the number of items answered (i.e., mean score). Consistent with previous studies (Kocsis, et al., 1988; Kocsis, et al., 2002) the mean overall adjustment score was used as an index of general social functioning (BL $\alpha = .41 - .81$, FU1 $\alpha = .55 - .89$).

The Inventory of Interpersonal Problems-64 (IIP-32; Alden, Wiggins, & Pincus, 1990). The IIP-32 is a self-report questionnaire measuring interpersonal difficulties, with eight subscales derived from dimensions of affiliation (hostile/cold to friendly behaviour) and dominance (submissive to controlling behaviour). The eight sub-scales are; Domineering (e.g., “I try to control other people too much”); Intrusive/Needy (e.g. “I find it difficult to spend time alone”); Self-Sacrificing (e.g., “I put other people’s needs before my own too much”); Overly-accommodating (e.g., “I let other people take advantage of me too much”); Non-assertive (e.g., “I find it difficult to let other people know what I want”); Socially inhibited (e.g., “I am too afraid of other people”); Cold (e.g., “I keep other people at distance too much”); Vindictive (e.g., “I am too suspicious of other

people”. All sub-scales demonstrated good internal consistency (BL $\alpha = .61 - .86$, FU1 $\alpha = .67 - .92$).

Depressive Interpersonal Relationships Inventory – Reassurance Seeking Scale (DIRI-ERS; Joiner & Metalsky, 2001). The DIRI-ERS is a four-item sub-scale of the DIRI which measures frequency of engaging in excessive reassurance-seeking behaviours (e.g., “In general, do you find yourself often asking the people you feel close to how they truly feel about you?”) on a seven-point scale (1, no, not at all – 7, yes, very much). The scale had good internal consistency ($\alpha = .88$). Previous studies found cross-sectional and prospective relationships between excessive reassurance and depression (Starr & Davila, 2008).

8.4.9 Computation of interpersonal components

The interpersonal style components (submissive, needy and cold) which formed the basis for the previous thesis analyses (chapters 4 - 6) were manually computed using the same interpersonal variables (eight IIP sub-scales and DIRI-ERS scale) and applying factor weightings derived from the original principal components analysis (4.5.2). This generated equivalent interpersonal components to those used in the previous thesis analyses reported. The separate variables scores were converted to z scores and then multiplied by the component score coefficient. We also replicated the same pattern of results described in this study using component scores generated from a new principal component analysis which was undertaken using the same variables with the current sample data (sample 3). The results from the sample 3 component analysis closely resembled those obtained using the sample 2 data, providing confirmation of the reliability of the interpersonal component structure used in the thesis.

8.4.10 Procedure

Potential participants were identified via a search of GP electronic records using Read codes for mood disorders. Potential participants identified through this search process were sent a letter from their GP, with an information sheet enclosed, inviting them to participate in the study. Potential participants who expressed an interest in taking part in the study were contacted by a research officer to discuss the study and to screen for suitability. Those deemed eligible for the study were then invited to attend a more detailed face-to-face assessment, at which the SCID, BDI, RSQ, SAS-SR, IIP-32 and DIRI-ERS were administered. Following completion of the baseline assessment, participants were randomized to the concrete training, relaxation training or treatment as usual conditions. Participants attended a follow up assessment approximately eight weeks post randomization, at which point the study measures were repeated.

8.5 Results

8.5.1 Data preparation and cleaning

Data cleaning followed the protocol set out by Tabachnick and Fidell (2007; pp. 56 - 108). Initially this involved examining descriptive statistics and graphic representations of all key variables. This involved assessing whether variables were within range, were normally distributed, and considering the plausibility of means and standard deviations and assessing whether the correlations between variables were in the expected direction. If <10% of the data for a scale was missing at a given time point then a “prior knowledge” imputation method was applied (Tabachnick & Fidell, 2007). That is, for scales where a clear construct with multiple items with a high degree of internal inconsistency make up the scale, non-missing items were used to infer the score of the

missing value (the scale total divided by the number of completed items is imputed for the missing item(s) at that time point).

8.5.2 Background Characteristics

Preliminary analyses involved one-way multivariate ANOVAs with condition (CT, RT, & TAU) as a between-group factor to examine whether demographic and baseline pre-intervention variables differed between conditions (see Table 8.1) with age, level of depressive symptoms (BDI), level of rumination/brooding, social adjustment impairment, and interpersonal difficulties as dependent variables. These analyses revealed that, at baseline, there were no significant differences between conditions in age, $F(2,75) = .04, p = .96, \eta^2_p = .001$, level of depressive symptoms, $F(2,76) = .22, p = .81, \eta^2_p = .01$, level of rumination, $F(2,74) = .11, p = .89, \eta^2_p = .003$, social adjustment, $F(2,70) = .26, p = .77, \eta^2_p = .003$ and there were no between group differences in relation to the submissive, $F(2,68) = .18, p = .84, \eta^2_p = .01$, needy, $F(2,68) = .21, p = .81, \eta^2_p = .01$, or cold, $F(2,68) = .55, p = .58, \eta^2_p = .01$ interpersonal styles. Results from chi square tests revealed that there was no significant differences in the proportion of participants who were taking anti-depressant medication in each condition, $\chi^2(2) = .67, p = .71$, although there was a significant difference in the gender distribution between groups, $\chi^2(2) = 6.61, p < .05$. This reflected a higher proportion of female participants in the relaxation training group. To address this issue, gender was included as an independent variable in the secondary analyses which compared the CT and RT conditions.

8.5.3 Manipulation check: Effect of condition on rumination and brooding

In order to check that the experimental manipulation was successful in modifying

rumination, a 2 X 2 repeated measures ANOVA was conducted with Time (pre-treatment, post-treatment) as a within-subjects variable and condition (CT, TAU) as a between subjects variable and with rumination as the dependent Variable (DV). There was a significant main effect of Time, $F(1,45) = 29.56, p < .001, \eta^2_p = .40$, which was qualified by a significant Time by Condition interaction, $F(1,45) = 6.74, p < .05, \eta^2_p = .13$. As predicted, there was a significantly greater decrease in rumination in the CT condition compared to the TAU condition (Table 8.2).

As a further check of the experimental manipulation, a 2 X 2 repeated measures ANOVA was conducted with Time (pre-treatment, post-treatment) as a within-subjects variable and condition as a between subjects variable (CT, TAU) and with brooding as the DV. An equivalent pattern of results was obtained, so that there was both a main effect of Time, $F(1,45) = 21.07, p < .001, \eta^2_p = .32$, and a significant Time by Condition interaction, $F(1,45) = 4.99, p < .05, \eta^2_p = .10$. As predicted, there was a significantly greater decrease in brooding in the CT compared to the TAU condition (Table 8.2).

Table 8.2

Mean Pre and Post Intervention Scores for Key Study Variables by Condition (CT, RT and TAU)

Variable	CT (<i>n</i> = 24)		RT (<i>n</i> = 29)		TAU (<i>n</i> = 26)	
	BL	FU1	BL	FU1	BL	FU1
Assessment						
BDI	32.92 (10.32)	20.67 (15.72)	32.57 (10.65)	20.68 (13.38)	32.96 (9.31)	28.62 (11.20)
Rumination	57.46 (11.54)	41.47 (17.94)	58.91 (13.08)	49.10 (14.61)	58.87 (11.34)	53.22 (12.64)
Brooding	13.26 (3.67)	9.57 (4.76)	13.93 (3.95)	11.97 (4.00)	13.56 (3.09)	12.26 (3.25)
SAS-SR	2.51 (.56)	2.11 (.67)	2.51 (.51)	2.24 (.53)	2.61 (.55)	2.53 (.66)
Submissive	-.81 (.90)	.20 (1.03)	-.67 (.94)	-.15 (.90)	-.62 (1.25)	.01 (.98)
Needy	4.19 (3.56)	-.34 (.79)	3.69 (2.57)	.16 (.97)	3.67 (2.93)	.19 (.93)
Cold	-1.02 (1.00)	-.27 (1.10)	-.80 (1.02)	.11 (.80)	-.71 (.94)	.18 (.77)

Note. CT = Concrete training; RT = relaxation training; TAU = treatment as usual; BL = Baseline assessment; FU1 = Follow-up 1 assessment; BDI = Beck Depression Inventory; Brooding = Brooding sub-scale of the RRS; SAS-SR = Overall mean score for the Social Adjustment Scale-Self-report; Submissive = Submissive interpersonal style, Needy = Needy interpersonal style, Cold = Cold interpersonal style

8.5.4 *Effect of condition on social adjustment*

A 2 X 2 repeated measures ANOVA with Time (Pre-treatment, post-treatment) as a within-subjects IV, condition (CT, TAU) as a between-subjects IV, and with SAS-SR total mean as the DV was conducted to test the experimental hypothesis that there would be a significant improvement in social adjustment from pre to post intervention in the CT condition compared to the change in SAS-SR reported in the TAU condition. There was a significant main effect of Time, $F(1,40) = 11.50, p < .01., \eta^2_p = .22$. Although a larger improvement in social adjustment was reported in the CT condition (.40 change) compared to the TAU condition (.08 change), the Time by Condition interaction was not statistically significant, $F(1,40) = 1.47, p = .23, \eta^2_p = .04$ (Table 8.2).

8.5.5 *Effect of condition on the submissive interpersonal style*

A 2 X 2 repeated measures ANOVA with Time (pre-treatment, post-treatment) as a within-subjects independent Variable (IV), condition (CT, TAU) as a between-subjects independent variable, and with submissive interpersonal style as the dependent variable (DV) was conducted to test the experimental hypothesis there would be a significant improvement in submissive interpersonal style from pre to post intervention in the CT condition compared to the TAU condition. There was a significant main effect of Time, $F(1,36) = 50.25, p < .001., \eta^2_p = .58$, which was qualified by a significant Time by Condition interaction, $F(1,36) = 4.74, p < .05., \eta^2_p = .12$. As predicted, the decrease in maladaptive submissive interpersonal behaviour reported in the CT condition (-1.00) was significantly greater than the decrease in maladaptive interpersonal behaviour reported in the TAU condition (-.62, see Table 8.2, note that a lower score for this variable indicated

a higher level of difficulty, thus for this variable the negative change score indicated a reduction of interpersonal difficulty, Table 8.2)¹.

8.5.6 Effect of condition on depressive symptoms

A 2 X 2 repeated measures ANOVA with Time (Pre-treatment, Post-treatment) as a within-subjects IV, condition (CT, TAU) as a between-subjects IV, and with BDI-II total mean as the DV was conducted to check whether there was a significantly greater decrease in depressive symptoms in the CT condition compared to the change in depressive symptoms reported in the TAU condition. There was a significant main effect of Time, $F(1,48) = 36.93, p < .001, \eta^2_p = .44$, which was qualified by a statistically significant Time by Condition interaction, $F(1,48) = 8.38, p < .01, \eta^2_p = .15$. The reduction in depressive symptoms reported in the CT condition (12.25) was significantly greater than the reduction in depressive symptoms reported in the TAU condition (4.34, Table 8.2).

Because this raises the possibility that change in submissive interpersonal difficulties was due to improvement in depressive symptoms, rather than resulting from the manipulation of rumination/brooding, further comparisons of CT versus RT were conducted to establish whether the effect of CT on submissive interpersonal behaviour was unique to the treatment that specifically targeted rumination relative to another active intervention.

8.5.7 Manipulation check: Effect of RT on rumination/brooding

A 2 X 2 X 2 repeated measures ANOVA was conducted to check whether the change in rumination in the CT condition was greater than the change in rumination reported in the RT condition, with condition (CT, RT) and gender as between-subjects

variables, with Time (Pre-treatment, post-treatment) as a within-subjects variable and with rumination as DV. There was a significant main effect of Time, $F(1,47) = 30.09$, $p < .001$, $\eta^2_p = .39$. However, the Time by Condition interaction was not statistically significant, $F(1,47) = 1.66$, $p = .20$, $\eta^2_p = .03$, even though the reduction in rumination reported in the CT condition (15.99) was greater than that reported in the RT condition (9.81). There was a non-significant gender by condition interaction, $F(1,47) = .23$, $p = .64$, $\eta^2_p = .01$ and the three-way interaction between condition, gender and time was not statistically significant, $F(1,47) = .73$, $p = .40$, $\eta^2_p = .02$.

Another 2 X 2 X 2 repeated measures ANOVA was conducted to check whether the change in brooding in the CT condition was greater than the change in brooding reported in the RT condition, with condition (CT, RT) and gender as between-subjects variables, with Time (Pretreatment, posttreatment) as a within-subjects variable and with brooding as DV. There was a significant main effect of Time, $F(1,47) = 22.01$, $p < .001$, $\eta^2_p = .32$. Although the reduction in brooding reported in the CT condition (3.69) was greater than that was reported in the RT condition (1.96), the difference was not statistically significantly, $F(1,47) = 1.73$, $p = .20$, $\eta^2_p = .04$. There was a non-significant gender by condition interaction, $F(1,47) = .72$, $p = .72$, $\eta^2_p = .02$ and the three-way interaction between condition, gender and time was also not statistically significant, $F(1,47) = .99$, $p = .33$, $\eta^2_p = .02$.

8.5.8 Manipulation check: Effect of CT and RT on depressive symptoms

A 2 X 2 X 2 repeated measures ANOVA was conducted to check whether the change in depressive symptoms in the CT condition was greater than the change in depressive symptoms reported in the RT condition, with condition (CT, RT) and gender

as between-subjects variables, with Time (Pretreatment, posttreatment) as a within-subjects variable and with BDI-II as DV. There was a significant main effect of Time, $F(1,47) = 35.47, p < .001, \eta^2_p = .43$. The Time by Condition interaction was not statistically significant, $F(1,47) = .78, p = .38, \eta^2_p = .02$. The reduction in depressive symptoms reported in the CT condition (12.25) was statistically equivalent to the reduction in depressive symptoms reported in the RT condition (11.89, Table 8.2). There was a non-significant gender by condition interaction, $F(1,47) = .53, p = .47, \eta^2_p = .01$ and the three-way interaction between condition, gender and time was also not statistically significant, $F(1,47) = 1.62, p = .21, \eta^2_p = .03$.

8.5.9 Effect of CT and RT on maladaptive interpersonal behaviour

A 2 X 2 X 2 repeated measures ANOVA was conducted to check whether the reduction in submissive interpersonal behaviour in the CT condition was greater than the reduction in submissive interpersonal behaviour in the RT condition, with condition (CT, RT) and gender as between-subjects variables, with Time (T1, T2) as a within-subjects variable and with the submissive interpersonal component as DV. There was a significant main effect of Time, $F(1,40) = 38.80, p < .001, \eta^2_p = .49$. There was a marginally statistically significant Condition by Time interaction, $F(1,40) = 3.39, p = .07, \eta^2_p = .08$. The reduction in submissive interpersonal behaviour reported in the CT condition (-1.00) showed a trend to be greater than the reduction in maladaptive interpersonal behaviour reported in the RT condition (-.52). There was a non-significant gender by condition interaction, $F(1,43) = .02, p = .90, \eta^2_p = .001$, and the three-way interaction between condition, gender and time was also not statistically significant, $F(1,43) = .08, p = .77, \eta^2_p = .002$.

8.6 Discussion

The aim of the present study was to test hypotheses that rumination plays a causal role in influencing: a) poor social adjustment and b) submissive interpersonal behaviours. These hypotheses were tested by comparing an intervention known to reduce rumination (CT) with a control condition (TAU). The primary hypotheses were that CT would produce a significant improvement in social adjustment and reduction in problematic submissive interpersonal behaviour from pre to post intervention, compared to TAU. Confirming that the experimental manipulation had worked, there was a significant reduction in rumination (and brooding) in the CT condition compared to the TAU condition. However, inconsistent with the second hypothesis, there was a minimal difference between change in social adjustment which was reported in the CT (.40) compared to TAU (.08) condition.

Consistent with the third hypothesis, there was a significantly greater decrease in submissive interpersonal difficulties in the CT condition compared to the TAU condition. Thus, as predicted, a manipulation which successfully reduced rumination also reduced maladaptive submissive interpersonal behaviours. This finding extends previous results which showed that rumination was significantly correlated concurrently with the submissive interpersonal style, controlling for depression and other interpersonal styles, in a heterogeneous adult sample (Chapter 4). Importantly, the results suggest that whereas maladaptive interpersonal style is generally quite stable over time (as reported in Chapter 6), it is accessible to change via manipulating rumination.

It is of interest that, whereas it was previously demonstrated that rumination prospectively predicted poor social adjustment (Chapter 7), reducing rumination in this

study sample did not lead to a greater improvement in social adjustment than was reported for those in the TAU condition. Moreover, this finding contrasts to results from other clinical trials which have evaluated the effect of psychological treatments for depression (in conjunction with antidepressant medication) on social adjustment, and which have reported that psychological interventions improved social functioning to a greater extent than antidepressant medication alone (Coulehan, Schulberg, Block, Madonia, & Rodriguez, 1997; Hirschfeld et al., 2002; Scott, et al., 2000). One explanation for these different results might be that concrete training is less effective, in terms of improving social adjustment, than other psychological interventions. Psychological interventions which were previously found to improve social functioning include interpersonal psychotherapy (IPT, Coulehan, et al., 1997), Cognitive Behavioural Analysis System of Psychotherapy (CBASP, an intervention which is focused on improving social problem solving, Hirschfeld, et al., 2002) and Cognitive Therapy (Scott, et al., 2000). Both IPT and CBASP are specifically focused on addressing interpersonal difficulties which could potentially explain their greater impact on social functioning than CT.

Differences in sample composition might be another relevant factor which explains why these previous studies found an effect of treatment of social functioning; whilst Scott, et al. (2000) found that cognitive therapy improved social functioning, it is of note that this study used a sample comprising individuals who were not currently depressed (with residual depressive symptoms), making a direct comparison with the current study results problematic. Another factor which limits making between study comparisons is differences in sample size (Coulehan, et al., 1997, $N = 276$, Hirschfeld, et

al., 2002, $N = 681$, Scott, et al., $N = 158$). Clearly, these previous studies would have had greater statistical power to detect treatment effects.

Interestingly, in both the current study and one previous study which included a follow-up assessment immediately post intervention (Hirschfeld, et al., 2002) the level of impairment in social functioning which was reported by patients at treatment end indicated that they were still experiencing a clinically significant level of impairment in social adjustment. Moreover, it is also of note that Coulehan, et al. reported a significant improvement in social functioning, attributable to IPT, at four months post treatment completion (results from a post intervention immediately following the completion of treatment were not reported). Thus, an alternative possibility (which can be empirically tested following completion of the trials second follow-up after a further three months) is that those in the CT and TAU conditions might exhibit differential rates of improvement in social adjustment at subsequent follow-up assessments.

Results from the secondary analyses comparing CT versus RT indicated that, contrary to prediction, CT did not produce a significantly greater reduction in rumination than RT. This finding suggests that both CT and RT, when rumination is made a focus of their treatment rationale, and when warning signs for rumination are highlighted in the treatment, can be effective at reducing rumination. Although CT and RT also reduced depression (and did not statistically differ in their treatment effect), we were not able to use the comparison of these treatments as a means to rule out the effects of symptom improvement in accounting for reduced maladaptive submissive interpersonal behaviours because CT and RT also had statistically significant effects on rumination. Thus, any improvement in social adjustment or interpersonal behaviours found for these treatments

could be due to reduced rumination and/or reduced symptoms of depression. In the absence of this additional check, there thus remains the possibility that the improvement in submissive behaviour found in the CT condition relative to the TAU condition was secondary to improvement in depressive symptoms rather than reduction in rumination. It is therefore not possible to be definitive that the reduction in submissive behaviour was caused by a reduction in rumination alone. Because rumination, social adjustment, and depression were all measured concurrently at each time point, it is not possible to determine whether change in one of these variables preceded change in another of these variables (see Kraemer, et al., 2000).

It is also important to note that CT involves training people to switch to a more adaptive cognitive style which promotes better problem solving and a more constructive, action-oriented, approach to dealing with life's difficulties. An alternative explanation for the reduction in submissive behaviours is that this focus on adopting an action-oriented approach within the treatment directly reduces passivity rather than the reduction of rumination. Consistent with this possibility, anecdotal clinical evidence from the RCT therapists indicates that those participants who were randomized to CT commonly reported focusing on interpersonal difficulties and using CT as a vehicle for generating constructive solutions to deal with these both during the therapy sessions and their daily practice. In order to fully disentangle whether the effect of CT on interpersonal behaviour is due to reducing rumination or increasing action-oriented problem-solving, future studies would need to include measures of both at multiple time points during the baseline assessment and initial treatment phases. In addition, further experimental investigation could usefully be undertaken to investigate how CT reduces maladaptive

interpersonal behaviour.

A number of limitations with the current study design are noteworthy. One issue is that the study is reliant on self-report measurement of brooding, social adjustment and maladaptive interpersonal behaviour. This raises the possibility that the results reflect a reporting bias. However, in order to ensure the reliability of the current study results, replication using alternative observational measures, or introducing different viewpoints (e.g., partner measures of relationship satisfaction) is clearly required. A second limitation was sample size: the ANOVA tests reported were under-powered to test for interaction effects after including gender as an additional IV, leading to increased risk of Type II error. Follow-up analyses using the whole RCT study sample are required to address this issue. Third, as noted earlier, because rumination, social adjustment, and depression were measured concurrently at each time point, it is not possible to establish mediation (Kraemer, et al., 2000), and, as such, it cannot be ruled out that any improvement in rumination or maladaptive interpersonal behaviour is due to improvement in symptoms (or vice versa).

Despite these limitations, this study is nonetheless the first to demonstrate that an intervention which reduces rumination decreases submissive interpersonal behaviour. The finding that an intervention designed to manipulate rumination reduced rumination and reduced submissive interpersonal behaviour relative to a control intervention provides a first step towards establishing that rumination may play a causal role in maintaining submissive interpersonal behaviours. The failure to find that manipulating rumination influenced submissive behaviours would have disconfirmed the hypothesis – the positive finding here now requires further investigation to rule out alternative

accounts for the effect of the manipulation.

Key strengths of the current study design were utilization of a clinical sample of depressed adults, increasing the clinical relevance of the findings, and adoption of a novel extended experimental method which allowed for the manipulation of rumination outside of the laboratory. The results suggest that a cognitive intervention which specifically targets harmful rumination can lead to decreased difficulties associated with excessive submissiveness. However, further assessment of the longer term benefits of reducing rumination on interpersonal behaviour and social adjustment, including real-world analyses, are required to validate these preliminary findings.

In conclusion, the study contributes towards an emerging understanding of the interpersonal context of rumination. The findings suggest that clinical interventions which target the ruminative tendency to engage in abstract generalised thinking about life's difficulties might be an effective way to decrease maladaptive interpersonal behaviours and increase engagement in pro-social behaviour. These results extend and clarify previous results which indicated that rumination was correlated with maladaptive interpersonal behaviours, by indicating that increasing concrete thinking reduces submissive interpersonal difficulties characterised by being overly-accommodating, unassertive and self-sacrificing.

Footnotes

1. Supplementary analyses were undertaken in which the change in needy and cold interpersonal styles was examined: A 2 X 2 repeated measures ANOVA with Time (Pre-treatment, post-treatment) as a within-subjects independent Variable (IV), condition (CT, TAU) as a between-subjects independent variable, and with needy interpersonal style as the dependent variable (DV) was conducted to test the alternative hypothesis that there would be a significant improvement in needy interpersonal style from pre to post intervention in the CT condition compared to the TAU condition. There was a significant main effect of Time, $F(1,36) = 92.17, p < .001, \eta^2_p = .72$. The Time by Condition interaction was not statistically significant, $F(1,36) = 1.00, p = .35, \eta^2_p = .03$. Thus, the decrease in maladaptive needy interpersonal behaviour reported in the CT condition was not significantly greater than the decrease in maladaptive needy behaviour reported in the TAU condition.

Another 2 X 2 repeated measures ANOVA with Time (Pre-treatment, post-treatment) as a within-subjects independent Variable (IV), condition (CT, TAU) as a between-subjects independent variable, and with the cold interpersonal style as the dependent variable (DV) was conducted to test the alternative hypothesis there would be a significant improvement in cold interpersonal style from pre to post intervention in the CT condition compared to the TAU condition. There was a significant main effect of Time, $F(1,36) = 34.25, p < .001, \eta^2_p = .49$. The Time by Condition interaction was not statistically significant, $F(1,36) = 1.07, p = .29, \eta^2_p = .03$. Thus, the decrease in maladaptive cold interpersonal behaviour reported in the CT condition was not

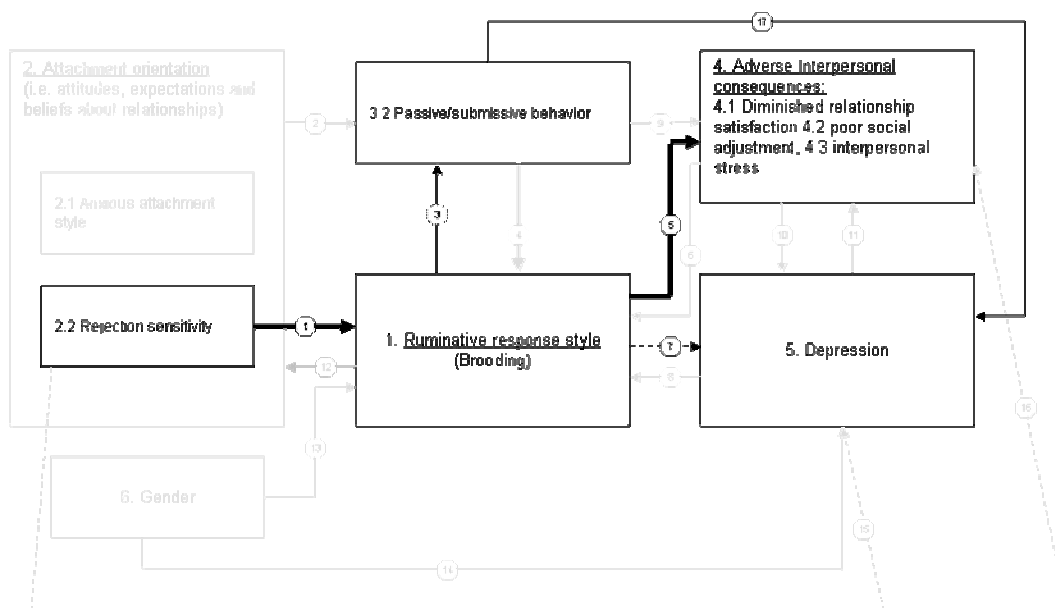
significantly greater than the decrease in maladaptive cold behaviour reported in the TAU condition.

CHAPTER 9: General Discussion

The overarching thesis aim was to increase understanding of the temporal and causal relationship between rumination, poor social adjustment, and depressogenic interpersonal factors. Analyses were reported from three different samples; a group of remitted depressed adults (sample 1, $N = 57$, Chapter 3), a heterogeneous adult sample of currently depressed, previously depressed, and never depressed adults (sample 2, $N = 103$, Chapters 4 - 7), and another adult sample, all of whom met DSM-IV criteria for current major depression (sample 3, $N = 79$, Chapter 8). In this chapter, I integrate and discuss the thesis findings, with reference to the stated hypotheses and hypothesised thesis model (Figure 2.1, Chapter 2), and propose a revised model which has been updated in light of the thesis findings (Figure 9.2, paths in black were supported by the data, greyed paths were included in the original model, but were not substantiated by the data). I then consider the implications of the findings for existing theoretical models which underpin current understanding of the social context of rumination.

Figure 9.1

Final Thesis Model



Bold lines (paths 1 and 5) denote primary thesis hypotheses which were supported by the data. Dashed lines indicate that the direct relationship is mediated by another variable (path 7). Dotted line indicates that the data partially supported the stated hypothesis (path 3). Grey lines indicate that the predicted relationship was not supported by the thesis findings

9.1 Summary of the thesis findings

The following section summarizes the thesis hypotheses and the key results obtained.

9.1.1 Hypothesis 1. Rumination is associated with a specific attachment orientation and sub-set of maladaptive interpersonal behaviours

Drawing on previous theorizing about the interpersonal context of rumination (Nolen-Hoeksema & Jackson, 1999; Nolen-Hoeksema & Davis, 1999; Saffrey & Ehrenberg, 2007), it was hypothesised that rumination is associated with an attachment orientation incorporating fear of rejection (operationalized using measures of rejection

sensitivity, ARSQ, Downey & Feldman, 1996, and anxious attachment style, ECR-R, Fraley, et al., 2000), submissive interpersonal behaviour (operationalised as an interpersonal component with highest loadings on the overly-accommodating, non-assertive, and self-sacrificing sub-scales of the IIP-64, Alden, et al., 1990). To test this first hypothesis, self-report questionnaire data was collected from a mixed sample of depressed ($n = 29$), previously depressed ($n = 42$), and never depressed ($n = 32$), adults (Chapter 4, study 2). Two hierarchical regression models were calculated to test this hypothesis. In the first hierarchical regression model, rumination was the criterion variable and gender, depressive symptoms, and the maladaptive, submissive, needy and cold, interpersonal styles were predictor variables. As predicted, rumination (brooding, but not reflection) was associated with the submissive interpersonal style, but was not correlated with the needy or cold interpersonal styles, after controlling for gender and depressive symptoms.

A second hierarchical regression model was calculated in which rumination was the criterion variable and depressive symptoms, gender and attachment orientation (rejection sensitivity, anxious and avoidant attachment styles) were predictor variables (chapter 4, study 2). As predicted, after controlling for gender and depressive symptoms, rumination (brooding) was associated most strongly with rejection sensitivity ($p = .05$) and was not associated with the avoidant attachment style. However, rumination was not associated with the anxious attachment style.

These analyses were subsequently replicated using the sample 3 data and also controlling for generalised anxiety symptoms (Section 4.11). Consistent with the study 2 analyses, the submissive interpersonal style was again associated concurrently with

rumination (brooding), after controlling for gender, depression, and generalised anxiety symptoms. However, the relationship between rejection sensitivity and rumination (brooding) was only approaching statistical significance after controlling for depression, gender, and generalised anxiety symptoms in this clinically depressed sample ($p = .09$).

In sum, the findings from two separate studies, which used two distinct samples, were consistent with Hypothesis 1, in that rumination (brooding) is associated with a specific sub-set of maladaptive interpersonal behaviours characterised by submissiveness and passivity (consistently supported) and with a specific attachment orientation characterised by rejection sensitivity (partially supported, with mixed findings).

9.1.2 Hypothesis 2. Rumination causes adverse interpersonal consequences (path 5)

Drawing on theoretical models of rumination which suggest that ruminative thinking adversely affects interpersonal relationships and social adjustment (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004), it was hypothesised that rumination fuels adverse interpersonal consequences. As a necessary first step towards testing this causal hypothesis, the prospective relationship between ruminative brooding prospectively predicting diminished relationship satisfaction was examined, using an opportunistic sample of data collected from participants allocated to the treatment as usual (TAU) condition of a randomized controlled trial evaluating mindfulness based cognitive therapy (Kuyken, et al. 2008, Chapter 2, study 1). Participants ($N = 57$ adults with a history of recurrent past major depression) were interviewed to assess depressive symptoms and completed self-report measures of brooding and relationship satisfaction, at intake into the study (Time 1) and three months later (Time 2). Replicating previous

findings (Kuehner & Bueger, 2005), rumination (brooding) was associated concurrently with diminished relationship satisfaction. Moreover, consistent with the Hypothesis 2 prediction, brooding prospectively predicted diminished relationship satisfaction three months later, after controlling for baseline relationship satisfaction.

Having established that Hypothesis 2 warranted further examination, these preliminary prospective findings were extended, by testing whether rumination prospectively predicted (a) poor social adjustment, using the Social Adjustment Scale – Self Report (SAS-SR, Weissman, 1999), a more comprehensive index of social functioning which encapsulated performance, interpersonal behaviour, conflict and feelings and satisfaction across the domains of work, social life, familial and partner relationships, and (b) increased interpersonal stress (dependent interpersonal event stress and chronic interpersonal stress, Chapter 7, study 5). Incorporating a second assessment time-point, collected approximately six months post baseline for the study 2 participants, enabled the prospective longitudinal relationship between rumination, social adjustment, and interpersonal stress to be examined. As predicted, rumination (brooding) prospectively predicted poor social adjustment six months later, after statistically controlling for Time 1 social adjustment, depression status and gender (7.9). Partially consistent with the predictions, rumination (brooding) predicted chronic interpersonal stress, but did not predict increased dependent interpersonal event stress (7.5).

As a more direct step towards assessing the causal nature of relationship between rumination and poor social adjustment, study 6 (Chapter 8) assessed whether the experimental manipulation of rumination (reducing rumination via a clinical intervention that targeted rumination versus treatment-as-usual that does not target rumination)

improved social adjustment. Seventy-nine depressed adults, recruited into a randomized controlled trial, were randomized to participate in concreteness training (CT), a cognitive intervention that specifically targeted rumination through cognitive exercises, treatment as usual (TAU) and relaxation training (RT), an active control intervention matched for non-specific factors. Participants completed self-report measures of depressive symptoms, rumination (brooding), and social adjustment, pre and post the intervention. Inconsistent with the study predictions, although there was an overall pre to post intervention improvement in social adjustment, this was not significantly greater in the active CT condition compared to the TAU condition (8.5).

In sum, two prospective longitudinal studies, which used two distinct samples, found that rumination (brooding) predicted global interpersonal difficulties and overall poor social functioning, as assessed by relationship satisfaction (study 1), social adjustment (study 5) and chronic life stress (study 5) (i.e., on general and extended measures of social or relationship difficulties, rather than on measures of specific events). This is consistent with Hypothesis 2 in that it suggests that rumination is an antecedent and risk factor for adverse social consequences, when assessed in an ecologically valid way. In contrast, and inconsistent with Hypothesis 2, the experimental manipulation within the RCT failed to influence social adjustment differentially between conditions. However, this could be because (a) changes in social adjustment occur over a medium-term time course, and were therefore not detectable at the point of the post intervention assessment, and/or (b) the intervention is not sufficiently efficacious to change a long-standing pattern of social difficulties. That is, the failure to observe differential change in social adjustment across the intervention conditions does not necessarily rule out the

possibility that rumination causally contributes to adverse social consequences.

9.1.3 Hypothesis 3. Rumination fuels specific maladaptive interpersonal behaviours

Consistent with the conceptualisation of rumination as a passive response mode that inhibits individuals from asserting control over their external environment (Lyubomirsky, et al., 1999; Nolen-Hoeksema, 1991, 2004) and that negatively biases how they perceive their relationships and interpersonal problems (Lyubomirsky, et al., 1999; Nolen-Hoeksema & Davis, 1999; Tse & Bond, 2004), it was hypothesised that rumination would generate submissive interpersonal behaviour and increased rejection sensitivity. To test these predictions, hierarchical regression models were calculated in which the Time 2 measures of submissive interpersonal style and rejection sensitivity were criterion variables, with rumination at Time 1 as the main predictor variable and with depressive symptoms and gender as control variables in each model. Contrary to the thesis predictions, rumination was a non-significant predictor of the criterion variable in each of these models (paths 3 and 12).

As a more direct step towards assessing the causal nature of relationship between rumination and maladaptive submissive interpersonal behaviours, study 6 (Chapter 8) tested whether the manipulation of rumination (reducing rumination via a clinical intervention that targeted rumination versus treatment-as-usual that does not target rumination) reduced submissive interpersonal behaviour. As predicted, there was an overall reduction in maladaptive submissive interpersonal behaviour which was significantly greater in the CT compared to the TAU (and RT, approaching statistical significance, $p = .07$) conditions. Consistent with the thesis predictions, there was no

difference in the reduction in needy or cold interpersonal behaviours which was reported in the CT condition compared to the TAU condition (although there was a significant pre to post intervention improvement across both conditions).

9.1.4 Hypothesis 4. Interpersonal factors predict rumination

Theories of the interpersonal context of rumination suggest that interpersonal factors confer vulnerability to rumination (Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, et al., 1999; Saffrey & Ehrenberg, 2007). Drawing on these converging theories, it was predicted that (a) rejection sensitivity would prospectively predict increased rumination; (b) submissive interpersonal behaviours would fuel rumination. To test these predictions, a series of hierarchical regression models were conducted, using the sample 2 dataset, in which Time 2 rumination (and its sub-components) was the criterion variable. Time 1 rumination, gender and depressive symptoms were entered as control variables and the Time 1 interpersonal variables (ARSQ and submissive interpersonal style) were the main predictor variables (Chapter 6, study 4). As predicted, Time 1 rejection sensitivity prospectively predicted increased rumination (brooding) at Time 2. A supplementary analysis which was undertaken to test whether rejection sensitivity predicted increased submissive interpersonal behaviours as well as rumination, i.e., path 2 in the hypothesised model, found that this secondary prediction was not supported by the data. Contrary to the predictions derived from the hypothesised model, Time 1 submissive interpersonal did not prospectively predict increased rumination at Time 2.

Further analyses were undertaken in order to examine whether poor social

adjustment and interpersonal stress may also be predictive of rumination (i.e., to examine the reverse direction of causality/temporal precedence from Hypothesis 2, path 6 in the hypothesised model). Hierarchical regression models were calculated in which Time 2 rumination (brooding) was the criterion variable. Time 1 rumination, gender and depressive symptoms were entered as control variables and poor social adjustment at Time 1 and chronic interpersonal stress (over the duration of the study, assessed at Time 2) were the main predictor variables, and Time 2 rumination was the criterion variable. Chronic interpersonal stress at Time 2 was associated with increased rumination at Time 2 ($p = .05$). In sum, there was some evidence consistent with Hypothesis 4, in that the interpersonal factor of rejection sensitivity prospectively predicted rumination. However, it appears that this was a specific effect, since submissive behaviour did not predict rumination.

9.1.5 Hypothesis 5. Rumination and interpersonal factors prospectively predict depression

Consistent with the RST model (Nolen-Hoeksema, 1991, 2004) and interpersonal theory of depression (Carnelley, et al., 1994; Gilbert, et al., 1995; Downey & Feldman, 1996), it was predicted that rumination and the submissive interpersonal style would prospectively predict increased depression (depressive symptoms and diagnostic status, path 7). Moreover, drawing on previous theory, which conceptualised rumination as a mediating mechanism linking underlying interpersonal vulnerability factors to depression (Spasojević & Alloy, 2001), it was further predicted that the relationship between interpersonal style and prospective depression is dependent on shared variance with rumination (Chapter 5, study 3). To test this prediction, a series of hierarchical regression

models were calculated, which tested whether rumination and the submissive interpersonal style independently predicted future depression and investigated their interdependence in predicting depression. When examined separately, rumination (brooding) and the submissive interpersonal style prospectively predicted increased depressive symptoms six months later, after controlling for baseline depressive symptoms and gender. When examined together, the submissive interpersonal style but not brooding predicted depression, indicating that the submissive interpersonal style may mediate the effect of brooding on future depression. Contrary to the study prediction, rejection sensitivity did not predict increased depressive symptoms.

Supplementary analyses were undertaken to test whether the needy interpersonal style (which incorporated excessive reassurance-seeking behaviour) and cold interpersonal styles predicted increased depression. This therefore tested a key prediction made by Coyne's (1976a, 1976b) interactional model of depression that excessive reassurance-seeking predicts depression. Neither the needy interpersonal style nor the cold interpersonal style were significant predictors of Time 2 depressive symptoms. In sum, Hypothesis 5 was partially supported: both rumination and interpersonal style (submissive behaviour) prospectively predicted depression. However, it appeared that submissive behaviour mediated the effect of rumination on subsequent depression, rather than the reverse, as predicted.

9.1.6 Hypothesis 6. Brooding is the most maladaptive component of rumination

Because recent psychometric analyses have identified brooding (defined as 'a passive comparison of one's current situation with some unachieved standard', Treynor,

et al., 2003, p.256) as the most maladaptive component of rumination, it was anticipated that the predicted pattern of results (Hypothesis 1-Hypothesis 5) would be obtained for the overall rumination scale and the brooding sub-scale, but not the less harmful reflection sub-scale. Overall, the results obtained were consistent with this prediction. Thus, brooding, but not reflection, was significantly correlated with the maladaptive submissive interpersonal style and rejection sensitivity, prospectively predicted poor social adjustment, increased chronic interpersonal stress and elevated depressive symptoms.

9.2 Discussion of the thesis findings

In sum, whilst parts of the proposed model (as indicated by black lines in Figure 9.2) were corroborated by the thesis results, other elements of the model were not. In this section, I examine the implications of the obtained findings for the key cognitive and interpersonal theories that underpin our current understanding of the interpersonal context of rumination as discussed in the literature review.

9.2.1 Implications of study findings for Response Styles Theory (RST)

9.2.1.1 Relationship between rumination, interpersonal factors, and depression

Nolen-Hoeksema's (1991; 2004) RST predicts that rumination in response to feeling sad or depressed confers vulnerability to the onset of new depressive episodes and prolongs depressed mood. Consistent with this hypothesis, and consistent with previous longitudinal findings which have demonstrated that rumination prospectively predicts increased depression (Just & Alloy, 1997; Nolen-Hoeksema, 2000; Skitch & Abela, 2008; Spasojević & Alloy, 2001), rumination (brooding) predicted increased depressive

symptoms and diagnostic status (depressed or not depressed) six months later (study 3, chapter 5). However, a novel finding, which is not predicted by RST (but which is not inconsistent with the hypothesised thesis model, Figure 2), was that the effect of rumination on subsequent depression was mediated via its relationship with the submissive interpersonal style (with rumination and the submissive interpersonal style assessed at the same time-point). Thus, the thesis results suggest an extension to RST whereby rumination indirectly contributes to depressed mood through shared variance with the submissive interpersonal style. This finding raises the possibility that an interpersonal variable (submissive interpersonal style) may be responsible for previous findings of rumination (incorporating the brooding factor) predicting depression, especially since interpersonal style was not assessed in the majority of studies examining rumination as a risk factor. Whilst this is only one report of this relationship, and therefore requires further replication, it is an important finding because it suggests an additional potential mechanism by which ruminative brooding influences risk for depression, via associated passive interpersonal behaviours. Thus, this finding suggests that it may not necessarily be the cognitive consequences of rumination, but rather correlated submissive interpersonal behaviours that best predict subsequent depression.

9.2.1.2 Rejection sensitivity as an antecedent of rumination

RST predicts that the ruminative response style derives from early relationships with caregivers, which develop either as a learnt response, whereby children emulate the passive response style modelled by caregivers (Nolen-Hoeksema, 1991; Nolen-Hoeksema, et al., 1995) or as a maladaptive form of emotion regulation, which is

triggered in response to neglectful, over-controlling, or abusive parenting (Nolen-Hoeksema, 2004; Spasojević & Alloy, 2002). To date, there has been limited investigation of developmental and interpersonal antecedents of rumination, with the majority of studies which have investigated this area reliant on retrospective accounts of early childhood experiences (e.g., Raes & Hermans, 2008; Spasojević & Alloy, 2002). Moreover, RST makes no specific prediction about how early adverse experiences continue to fuel rumination in adulthood. The current thesis finding that rejection sensitivity, the ‘psychological legacy’ of early experiences of parental rejection (Downey & Feldman, 1996, p.1328) prospectively predicts rumination suggests that it may be this persisting expectation of rejection that confers vulnerability to rumination in adulthood. Thus, rejection sensitivity may be a potential distal mechanism by which difficult early experiences are translated into later rumination.

9.2.1.3 Implications of study findings for Control Theory accounts of rumination

The finding that rejection sensitivity predicts rumination is consistent with a control theory account of rumination, which predicts that rumination is activated by a discrepancy between a desired goal and the actual current state (Carver & Scheier, 1981; 1982; Martin & Tesser, 1996). This control theory account has recently been argued to be consistent with the RST approach to rumination (Watkins, 2008). Indeed, Treynor, et al (2003, p. 256) interpreted brooding as “a passive comparison of one’s current situation with some unachieved standard”, consistent with a control theory account.

Rejection sensitivity renders the goals of maintaining relationships and avoiding abandonment especially salient and intrinsically linked to self definition (Ayduk &

Gyurak, 2008), whilst at the same time increasing the likelihood of perceiving rejection (Downey & Feldman, 1996; Mor & Inbar, 2009). Thus, in goal-discrepancy terms, individuals who are highly sensitive to rejection are more likely to perceive that the valued goals of avoiding rejection and maintaining relationships are not being met, generating the unresolved goal discrepancies that drive rumination (Martin & Tesser, 1996). Moreover, according to the control theory model, it will be particularly difficult for individuals to disengage from the goal of preventing rejection because this is an avoidance goal which cannot be satisfactorily resolved (Carver & Scheier, 1998), thus making it more likely that rejection sensitivity will generate ongoing cycles of ruminative thinking (i.e., unresolved goal related thoughts), relative to attainment-related goals which have a more clearly demarcated end point.

It is noteworthy that the hypothesised pathway between the anxious attachment style (employed as a further index of underlying fear of rejection/abandonment) and future rumination was not supported by the thesis results. It seems likely that this discrepancy reflects differences between the ARSQ and the ECR-R measures. The ARSQ assesses the tendency to both *fear* and *anxiously expect* rejection, whereas the ECR-R assesses only the tendency to *fear* rejection. Worrying about interpersonal rejection will be less distressing in the context of a low expectation that this is likely to occur, and will thus be less likely to fuel ruminative thinking. Arguably, the ARSQ has greater validity and sensitivity as a measure of rejection-sensitivity because this measure assesses both the fear of rejection (tapping into underlying dependency/helplessness concerns, e.g., belief that one cannot cope without the love and support of a close other) and the tendency to over-readily expect rejection (tapping into underlying beliefs that one is

unlovable, and that one will be rejected by close others). Thus, it may be that the expectation of potential rejection is a critical risk factor for rumination. Another difference between the ARSQ and the ECR-R measures is that the ECR-Anxious measure is specifically focused on romantic relationships, whereas the ARSQ assesses sensitivity to rejection more generally. Although the ECR-R is intended to be useable by individuals who are not currently involved in a romantic relationship, some of those participants who were not currently involved in a romantic relationship at the time of participating in the study ($n = 33$ participants not in a relationship at the baseline assessment, 32% of sample) reported finding it difficult to complete this questionnaire, raising questions about its validity with this group. Thus, the ARSQ may be a more robust measure for a wider sample of participants.

9.2.1.4 Rumination and the submissive interpersonal style: A common avoidance function?

The thesis results indicated that rumination is specifically associated with a submissive interpersonal style, characterised by overly-accommodating, non-assertive and self-sacrificing behaviour. RST has conceptualised rumination as a form of intrapersonal avoidance in which individuals think about difficulties rather than actively engaging with them in the real world (Nolen-Hoeksema et al., 2008) as well as a passive response mode (Nolen-Hoeksema, 1991, 2004) which inhibits motivation and initiative (Lyubomirsky & Nolen-Hoeksema, 1993). See also Moulds, et al., 2007; Watkins, et al., 2007 for similar conceptualisations of rumination as having an avoidant function. Similarly, the submissive interpersonal style (characterised by passive, non-assertive, overly-accommodating and self-sacrificing behaviours) is, by definition, interpersonally

avoidant, often focused on avoiding conflict, disagreement or attempting to prevent rejection. Thus, the convergent relationship between rumination and the submissive interpersonal style may reflect a common tendency towards intra and interpersonal avoidance. If rumination and submissive behaviour are different aspects of depressive avoidance then it may be more parsimonious to incorporate these constructs into one integrated theoretical framework which explains the role of avoidance in depression.

Ottenbreit and Dobson (2004, p. 293) argued that understanding the relationship between avoidance and depression is confused due to ‘inconsistent definitions of avoidance’. Thus, it warrants clarification that the thesis results implicate rumination in “avoiding taking action or responsibility for situations” (Nolen-Hoeksema, et al. 2008), i.e., as a passive response mode, rather than avoidance of intimacy and social withdrawal. In Study 4, rumination was not associated with the cold interpersonal style, which includes items such as ‘finding it difficult to socialise with other people’, and ‘keeping other people at a distance too much’, after controlling for depression. Interestingly, in a non-depressed student sample, Moulds et al. (2007) found that rumination was most strongly associated with ‘behavioural avoidance’ (assessed using the cognitive behavioural avoidance scale, CBAS, Ottenbreit & Dobson, 2004), which includes socially avoidant items such as ‘making excuses to get out of social activities’ and ‘wanting to leave social gatherings’. Although these findings appear somewhat discrepant, it is important to recognise that the cold interpersonal style involves ongoing avoidance of intimacy (e.g. difficulty making a commitment to, or experiencing love for, another person) as well as avoidance of specific social situations, whereas the socially avoidant items on the CBAS capture avoidance of specific social situations, consistent

with social anxiety, but do not incorporate intimacy avoidance. Thus, rumination may be associated with more avoidance in situations where individuals are concerned about negative evaluation. Moreover, there may also be differences in the form of avoidance which is associated with rumination between clinical and non-clinical samples.

9.2.1.5 Rumination, submissiveness and chronic strain: Incorporating the social rank perspective

Social rank theory (Gilbert, 1992; Gilbert, et al., 2002; Price, et al., 1997; Sloman, et al., 1994) provides an alternative theoretical framework for explaining the relationship between rumination and the submissive interpersonal style, which is also compatible with the conceptualisation of rumination and submissiveness as forms of avoidance. The model posits that rumination and submissive behaviour derive from the underlying perception of occupying a subordinate social status, and the corresponding belief that one cannot effectively assert control over one's social environment. Gilbert (1992) argued that when a subordinate self-perception is activated (in response to genes, learning and/or environmental contingencies), this triggers a negative mode of internalised self-reasoning (characteristic of ruminative thinking), inhibiting action and increasing submissiveness. Moreover, the social rank model assumes that maintaining a passive and submissive interpersonal approach necessitates a high level of self-monitoring of expressed behaviour via rumination (Cheung, et al., 2004; Jack, 1999).

RST has also implied a link between subordinate social status and rumination. Nolen-Hoeksema, et al. (1999) hypothesised and found that individuals with limited perceived mastery over their social environment are more likely to experience chronic strain, which in turn fuels rumination. Consistent with this hypothesis, the thesis results

indicated that chronic strain contributed to increased rumination (chapter 7).

9.2.2 Implications for theories predicting that rumination generates adverse interpersonal consequences (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004).

Several theories proposed that rumination is a key cognitive mechanism which generates adverse interpersonal consequences (Joiner, 2000; Lyubomirsky & Tkach, 2004; Tse & Bond, 2004). Consistent with these models, rumination prospectively predicted three of the four indexes of adverse interpersonal consequences which were included in the thesis: diminished relationship satisfaction (Chapter 3, study 1); poor social adjustment (Chapter 7, study 5) and increased chronic interpersonal stress (Chapter 7, study 5). By demonstrating the prospective longitudinal relationship between these variables, the results are consistent with the general prediction of these theoretical models (Lyubomirsky & Tkach, 2004; Tse & Bond, 2004) and previous cross-sectional findings (Lam, et al., 2003; Kuehner & Bueger, 2005), which proposed that rumination is a causal factor underlying social functioning impairment in depression. Thus, there is consistent and convergent evidence across different samples and different measures that rumination is a risk factor for general interpersonal difficulties. A tendency to ruminate thus seems to increase the likelihood of adverse interpersonal consequences.

It is of note that, although rumination prospectively predicted poor social adjustment (Chapter 7), manipulating rumination via concreteness training did not improve social adjustment (Chapter 8). One possibility is that change in social adjustment is a longer term outcome that requires a protracted period of improved interpersonal

behaviours. Consistent with this argument, previous findings that did report an improvement in social functioning associated with another psychological therapy (IPT) reported this improvement four months following therapy completion (Coulehan, et al., 1997).

Another possibility, consistent with Joiner's (2000) proposed self-propagatory model, is that poor social adjustment is maintained due to 'blame maintenance' (defined as negative mental representations held by the partners of depressed individuals which continue to guide attention and expectancies beyond the partner's recovery from depression, Joiner, 2000). That is, improving individual social adjustment may necessitate change not only on the part of the depressed individual, but also external change within their social milieu. Thus, Sacco (1999) argued that relationship partners develop mental representations of depressed individuals that become autonomous and which negatively bias how they perceive and respond to them.

Demonstrating how partner perceptions might impede the improvement of social adjustment, Sacco (1999, p.329) cites the example of a depressed client seen in therapy with his wife: 'Each time the therapist raises the issue of his returning to work, his wife objects claiming that he is 'not ready'. The client readily agrees. After several sessions the wife admits that she fears her husband will embarrass himself in front of his co-workers'. Moreover, previous research findings indicate that formerly depressed individuals retain restricted social networks and increased marital conflict (Barnett & Gotlib, 1988). In this case example, the wife's persisting perception of her husband as being incapable of returning to work is a factor which impedes improvement of social adjustment (i.e., his return to work). Thus, one possibility, in need of further

investigation, is that improving social adjustment might necessitate changing the way that depressed individuals are perceived by those close to them.

However, in addition to a general hypothesis that rumination will cause adverse interpersonal consequences, each of these models made more specific predictions about the mechanisms of how rumination might cause these adverse interpersonal consequences. It is therefore useful to consider the specific mechanisms hypothesised by each model in more detail. First, based on evidence implicating rumination as a form of avoidance, and theories implicating passive and submissive behaviour in the development of depression, it was hypothesised that rumination may influence adverse interpersonal consequences by increasing submissive and passive behaviour. Second, Joiner (2000) proposed that depressive rumination might be the ‘cognitive motor’ which fuels depressive interpersonal mechanisms. More specifically, Joiner (2000) hypothesised that rumination may drive maladaptive and self-propagating interpersonal behaviours such as excessive reassurance-seeking and negative feedback-seeking (in which people seek negative feedback from others in the form of criticism and rejection to verify their negative self-view). Third, Lyubomirsky and Tkach (2004) conceptualised a vicious cycle in which the combination of rumination, depressed mood, negatively biased thinking, poor problem solving, impaired motivation, inhibited instrumental behaviour, impaired cognition and concentration, and increased stress and interpersonal problems influence are predicted to feed back onto one another. Fourth, Tse and Bond (2004) hypothesised a number of different mechanisms by which rumination could contribute to adverse interpersonal consequences: (a) rumination results in insufficient cognitive resource being available for effective social perception; (b) self-focused attention

reduces cognitive capacity impairing interpersonal problem solving; (c) ruminative self-focus mediates the activation of negative cognitive schemata leading to a negative bias interpreting ambiguous social cues; (d) the inward self focus, which characterizes rumination, directs attention away from attending to other people's needs so that helping others will be viewed as less rewarding and pro-social behaviours will be reduced; (e) the recurrent self-examination which characterizes ruminative thinking and the associated activation of feelings of worthlessness will generate excessive reassurance-seeking, fulfilling the needs for self affirmation from others. The current thesis assessed some, but not all, of these proposed hypotheses regarding how rumination impairs social adjustment and generates adverse interpersonal consequences.

Working through the hypotheses above in turn, the thesis findings did not support the hypothesis that rumination causes adverse interpersonal consequences by increasing submissive interpersonal behaviours. The Study 4 (Chapter 6) results indicated that rumination did not prospectively predict increased maladaptive (submissive, needy or cold) interpersonal behaviours. Thus, this prospective longitudinal study did not find a significant predictive effect of rumination on maladaptive interpersonal behaviour which suggests that, in real-world settings, rumination is not a risk factor for maladaptive interpersonal behaviour. One possibility for the lack of a prospective relationship between rumination and maladaptive interpersonal behaviour obtained in Study 2 is that the high level of stability in interpersonal style over time (submissive interpersonal style, $r = .87$ $p < .001$) makes it hard to detect the influence of any other factors. Thus, interpersonal behaviour, as measured using the Inventory of Interpersonal Problems, may involve a more stable, trait-like component of interpersonal style. However, taking

account of the Study 6 results, which indicated that there was a significantly greater decrease in maladaptive submissive interpersonal behaviours over time in the CT compared to TAU condition, suggests that interpersonal style, as assessed via the IIP, may also incorporate a state component. That is, the results suggest that interpersonal style is amenable to change via intervention, but that it is likely to remain relatively stable over time when there is no conscious effort to change. However, it is unclear from the Study 6 results whether reducing rumination was the primary mechanism of change underpinning this improvement in interpersonal behaviour or whether this might be better explained due to some other factor such as reduced symptoms of depression, improved interpersonal problem solving or improving attentiveness to social cues.

Second, the thesis findings did not support the hypothesis that rumination fuels specific maladaptive interpersonal behaviours such as excessive reassurance-seeking (Joiner, 2000; Tse & Bond, 2004). There was no evidence that rumination increased excessive reassurance-seeking. As such, this finding is directly inconsistent with a principal hypothesis within Joiner's account of the role of rumination in interpersonal difficulties, and inconsistent with one of Tse and Bond's (2004) hypotheses. Moreover, the findings were inconsistent with Tse and Bond's (2004) prediction that rumination mediates the activation of underlying relational schema leading to a negative bias interpreting ambiguous social cues, at least with respect to concerns about rejection. Rejection sensitivity is a measure that captures underlying schema and beliefs about being unwanted by others, as well as negative expectations about how others will respond. Rumination did not predict increased rejection sensitivity. Thus, this finding is inconsistent with rumination activating underlying relational schema, although the

interpretation of ambiguous social cues was not directly tested.

Since rumination impairs social adjustment and generates chronic interpersonal stress, but does not do so by fuelling maladaptive interpersonal behaviour, then this suggests that there must be some other mechanism involved. Of the hypotheses outlined by Tse and Bond (2004) regarding the effect of rumination on social adjustment, the thesis results leave open the possibility that (a) rumination contributes to poor social adjustment by occupying cognitive resource necessary for effective social perception (i.e., ruminating causes individuals to miss important social cues); (b) rumination negatively biases how individuals perceive their social context (i.e., self-report of poor social adjustment primarily reflects a negative perceptual/reporting bias, see methodological limitations, 9.3), (c) rumination indirectly influences social adjustment by impairing problem solving (i.e., poor interpersonal problem solving mediates the effect of rumination on interpersonal behaviour); (d) rumination impairs social adjustment by inhibiting pro-social (helping) behaviour. Of these hypotheses, the first three were not directly tested in the current study, and the fourth was indirectly tested in that the IIP assesses a range of interpersonal behaviours, some of which would be consistent with pro-social (helping) behaviour. The failure to see any effect of rumination on all interpersonal behaviours makes it unlikely that rumination works by reducing pro-social behaviours. Thus, a priority for future research into the mechanisms of rumination in determining adverse interpersonal consequences is to test the hypotheses that rumination interferes with effective social processing, exacerbates negative interpretations of interpersonal situations, and impairs social problem-solving. In section 9.5, future research directions, I consider how future studies might test these hypotheses.

9.2.3 Implications for stress generation model

The thesis results extend understanding of mechanisms of stress generation in depression. First, the basic stress generation effect was replicated (i.e., depression predicted increased interpersonal stress), lending further support to Hammen's (1991) stress generation theory. Second, this was the first study to test whether rumination (brooding) predicts interpersonal event and chronic stress using the recommended contextual threat method (Chapter 7, Study 5). Interestingly, the thesis findings (Chapter 7) indicate that rumination contributes to the generation of chronic stress, but not the generation of increased dependent interpersonal event stress. Conversely, anxious attachment style and excessive reassurance-seeking predicted increased dependent interpersonal event stress, but these interpersonal variables did not predict increased chronic strain. Thus, the findings reported in Chapter 7 raise the question of why does rumination predict chronic interpersonal stress but does not predict interpersonal event stress? One possibility is that rumination contributes to the maintenance of chronic interpersonal stress because it keeps individuals stuck in a 'cycle of low control over their environment' (Nolen-Hoeksema et al., 1999, p.1062). Thus, rumination might maintain chronic strain by reducing motivation and initiative and inhibiting individuals from implementing actions to resolve persistent interpersonal difficulties (Lyubomirsky et al., 1999).

Moreover, because rumination reduces the likelihood that individuals will confront interpersonal problems, and because it is associated with submissive interpersonal style, rumination may be implicated in conflict avoidance (Joiner, 2000),

and therefore be less strongly implicated in the generation of interpersonal conflict events. Moreover, when individuals are caught up in ruminating they may be less likely to engage in active maladaptive behaviours, such as excessive reassurance-seeking, likely to generate a negative emotional response from close others and fuel acute interpersonal stress (e.g., serious arguments, separation and divorce). Building on the discussion earlier re the mechanisms of rumination, a potential hypothesis is that rumination contributes to chronic stress by leading to poor awareness of what is going on interpersonally, impairing responsiveness in close relationships, and by impairing social problem-solving, such that difficulties gradually increase.

Moreover, the thesis results indicate that stress generation in depression is not a homogeneous phenomenon, which can be satisfactorily explained via one common underlying mechanism, or in relation to one outcome measure. Instead, it seems that stress generation manifests differently for different individuals (i.e., increased interpersonal events versus increased ongoing chronic strain) and as the result of different underlying intra and interpersonal mechanisms.

9.2.4 Implications for Coyne's interactional model

In the current thesis, the needy interpersonal style (incorporating excessive reassurance-seeking) did not prospectively predict increased depressive symptoms (neither did excessive reassurance-seeking predict increased depression when examined separately, i.e., controlling for Time 1 depression and gender, but not controlling for shared variance with the other interpersonal styles, Chapter 5, Study 3). This finding is inconsistent with Coyne's (1976a, 1976b) interactional model of depression in which

excessive reassurance-seeking predicts depression, and other interpersonal theories which assume that neediness more generally confers vulnerability to depression (McBride & Bagby, 2006; Rude & Burnham, 1995; Zuroff, Mongrain, & Santor, 2004). However, the thesis results were consistent with previous findings which indicate that excessive reassurance-seeking confers vulnerability to interpersonal difficulties such as conflict and rejection (for a review see Starr & Davila, 2008) as close others become increasingly frustrated by their incessant demands.

A consideration of differences between Study 3 and previous studies which have demonstrated that excessive reassurance-seeking predicts depression (Davila, 2001; Joiner & Schmidt, 1998; Katz et al., 1998) provides some possible reasons which might explain the seemingly discrepant finding that excessive reassurance-seeking did not predict increased depression. First, on closer examination, the thesis results are consistent with Davila's (2001) findings, because although Davila found that excessive reassurance-seeking predicted increased depressive symptoms, as assessed via severity of SCID symptoms (a customized measure which derived a depressive symptom severity score based on responses to the standard SCID interview, adapted for use with a non-clinical sample), excessive reassurance-seeking did not prospectively predict increased depressive symptoms as assessed via the Beck Depression Inventory (the criterion variable in Study 3) in this previous study.

Joiner and Schmidt (1998) did find that excessive reassurance-seeking prospectively predicted increased depressive symptoms (assessed using the BDI). However, key differences between this previous study and Study 3 are that it used a much larger, non-clinical sample (air-force cadets, $N = 1,005$) and a shorter study duration (five

weeks). Moreover, the sample was somewhat unusual in that all participants in this study experienced a common stressful experience (undertaking their basic cadet training). Similarly, Katz et al. (1998) employed a non-clinical sample (dating women, $N = 134$) and shorter study duration (six weeks). Moreover, although they found a significant interaction (whereby excessive reassurance-seeking moderated the effect of partner devaluation on subsequent dysphoria), excessive reassurance-seeking did not independently predict increased dysphoria in this study.

To the best of my knowledge, Study 3 was the first investigation of the prospective relationship between excessive reassurance-seeking and depression in a predominately clinical sample. Given that excessive reassurance-seeking did prospectively predict increased interpersonal event stress, it seems plausible that it might contribute indirectly to depression via adverse interpersonal consequences. Consistent with this possibility, previous findings found that excessive reassurance-seeking was related to depressive symptoms through its relationship with minor social stressors (Potthoff, et al., 1995). Thus, the Study 3 findings raise questions about the ability of excessive reassurance-seeking to predict depression over a longer duration of time and in a more clinical sample. The results indicate that the effect of excessive reassurance-seeking is relatively mild and short lived. In this more clinical sample it is also possible that the effect of excessive reassurance-seeking on depression was obscured by other factors such as rumination and submissiveness, which emerged as significant predictors of subsequent depression.

9.2.5 Rumination and its subcomponents

One limitation which characterizes the literature underpinning RST is that the majority of studies have not differentiated between the more and less harmful components of rumination. As predicted, the thesis results consistently demonstrated that brooding was the most maladaptive component of rumination. This raises the question, which is not satisfactorily addressed within the RST account, of what it is about brooding which makes it an especially harmful component of rumination. Consistent with a control theory account of rumination, one possibility is that it is the repetitive discrepancy-focused thinking characteristic of brooding, which confers particular vulnerability to adverse interpersonal consequences. Goal discrepancy-focused thinking in the context of depressed mood might have particularly adverse interpersonal consequences because this type of negative repetitive thought is more likely to fuel avoidance and passive interpersonal behaviour than more action-oriented reflective thinking. For example, repeatedly thinking, ‘what am I doing to deserve this?’ (brooding scale item), seems less likely to generate an adaptive behavioural response than writing down what you are thinking about and analysing it (reflection scale item) which could more plausibly generate an adaptive interpersonal response. Consistent with this possibility, Burwell and Shirk (2007) found that brooding but not reflection was associated with a measure of ‘voluntary disengagement’ which incorporated a tendency to engage in denial, avoidance, and wishful thinking in response to stress.

9.2.6 Gender effects

RST evolved as a theory to explain gender differences in depression. The finding that depression is more common in women than men, and that rumination is a factor

which mediates this gender difference in depression, has been replicated in a number of studies (Butler & Nolen-Hoeksema, 1994; Grant, et al. 2004; Nolen-Hoeksema, et al., 1999; Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, et al., 1993; Roberts et al. 1998). Analyses of the Sample 2 data indicated that: (a) at baseline there were no significant gender differences in level of depressive symptoms or rumination; (b) gender did not prospectively predict depressive symptoms six months later, and a higher proportion of male (15% of completers) than female (11% of completers) participants met criteria for a major depressive episode at time 2; (c) there was no significant interaction between gender and rumination/brooding in predicting Time 2 depression. Because individuals were selected who were at risk for depression, within this group gender differences in rumination might not be anticipated (i.e., levels of rumination are higher in women in the general population, but gender differences in rumination not predicted amongst depressed individuals).

The majority of studies which have tested whether gender mediates the effect of rumination on depression have used large community samples (Butler & Nolen-Hoeksema, 1994; Grant, et al., 2004; Nolen-Hoeksema, et al., 1999; Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, et al., 1993). The primary aim recruiting participants for sample 2 was to obtain a sample with adequate variance in depressive symptoms, rumination and interpersonal difficulties necessary to be able to detect relationships between these variables. Thus, sample composition is likely to be a key factor which explains these seemingly discrepant findings. Given that males in sample 2 were under-represented and that the male participants who were included in this sample may not be representative of the general population, it is not clear to what extent the findings can be

generalised to men in the general population. Nonetheless, there is no clear theoretical rationale for predicting that the relationship between depression, rumination, interpersonal style and social adjustment (Chapters 4 to 7) is moderated by gender. This assumption was supported by the findings presented in Chapter 8 which included gender as an additional independent variable.

9.3 Methodological implications

The following section provides a summary of implications that the current thesis findings have with regards to the methodological approaches which might be applied to further investigate the interpersonal context of rumination. First, the thesis findings highlight the importance of statistically controlling for shared variance with other interpersonal variables and depressive symptoms when assessing the relationship between rumination and interpersonal style. By its wide inclusion of interpersonal measures, the current findings suggest that previous studies that only examined a single interpersonal variable and found a relationship with rumination (e.g., excessive reassurance-seeking) may simply reflect the association between that variable and depression or between that variable and another interpersonal variable (e.g., the submissive interpersonal style), rather than a direct relationship between that variable and rumination. Thus, such findings need to be treated more cautiously until replicated in the context of other interpersonal variables being measured.

Second, consistent with previous theory (Treyner, et al., 2003), the thesis results highlight that rumination (as assessed via the ruminative responses scale) is not a unitary construct, but is rather multidimensional, consisting of maladaptive passive brooding and

more active reflection. Thus, results from previous studies which did not differentiate between these two components when examining the relationship between rumination and interpersonal style/functioning are difficult to interpret, because they amalgamate these two components. However, our results suggest that it is only the brooding sub-component, and not reflection, which negatively affects interpersonal functioning. Moreover, the overall rumination scale is confounded with depressive symptomatology more generally, so that the reported relationship between the whole rumination scale and interpersonal style/functioning might be better attributed to the association between that variable and depression.

Third, the thesis results indicate that different mechanisms are involved in the generation of dependent interpersonal event stress and chronic interpersonal stress. Thus, research which sets out to advance understanding of mechanisms which underpin the process of stress generation should separately evaluate the effect of these variables on the generation of dependent interpersonal event stress and chronic interpersonal stress.

9.4 Strengths and limitations of the thesis research

Importantly, the thesis provides the first comprehensive assessment of the relationship between rumination and a spectrum of interpersonal variables incorporating insecure attachment orientations, specific maladaptive interpersonal behaviours, and adverse interpersonal consequences. A key strength of the thesis design was its inclusion of prospective longitudinal analyses derived from two different samples, enabling a robust evaluation of the interpersonal consequences, and in sample 2, temporal antecedents, of rumination. A novel methodological approach was employed for

manipulating rumination via a clinical intervention, which provided an ecologically valid paradigm for assessing the causal impact of reducing rumination on the interpersonal behaviour and social adjustment of clinically depressed individuals. An important focus for the thesis was to advance understanding of the process of stress generation in depression. The thesis incorporated the first empirical investigation of the relationship between rumination and interpersonal stress which used the 'gold standard' contextual threat approach, and incorporated assessment of independent event stress and chronic interpersonal stress. Stress generation is a well documented yet still relatively poorly understood phenomenon. Moreover, increasing understanding of stress generation in depression has important implications for the prevention of depression recurrence.

A number of limitations with the thesis are noteworthy. First, a key limitation of the thesis is its reliance on self-report measurement (of rumination, attachment orientation, interpersonal behaviours and social adjustment). This approach assumes that individuals are able to reliably recall and quantify the extent of repetitive thought processes, and to accurately and objectively evaluate features of their interpersonal style and social adjustment. The use of self-report assessment introduces the possibility that results obtained from depressed participants might have been influenced by a negative reporting bias. To enable an objective assessment of the reliability of participant ratings, data was collected from the partners of the participants in Study 2 ($N = 42$). Providing some reassurance regarding the reliability of participant self-report, there was a significant positive correlation between self and partner rating across all of the eight domains of the IIP (r values ranged from .40-.71). Nonetheless, it is of note that there was some variability in these correlations and that the largest discrepancy between self and

partner ratings occurred between depressed participants and their partners.

A second limitation of the thesis design was that the relationship between rumination, social adjustment, and interpersonal style was examined across two time points only. Because a primary aim of the thesis was to show the direction of effect between rumination and attachment orientation, behaviours, and social adjustment, assessing these variables at two time points provided a reasonable starting point for delineating the relationship between them. However, this clearly reflects a simplification of the dynamic inter-relationship which occurs between these variables over time. Moreover, because interpersonal style was relatively stable over time, this suggests that the measures used to assess interpersonal behaviour tapped into both state and trait components of interpersonal style, thereby reducing the likelihood of detecting whether rumination generates maladaptive interpersonal behaviour during the course of interactions. Another issue relates to the assessment of both independent variable and mediator variables at the same time point (Chapter 5 and Chapter 7). Whilst assessment of the independent variable and mediator at separate time points is not a pre-requisite for satisfying Baron and Kenny's criteria for mediation, it has been noted elsewhere (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001) that establishing that the independent variable is a temporal antecedent of the mediator is necessary to determine if change in one variable precedes change in another, i.e., to assess whether change in rumination precedes or follows change in depression.

A third limitation was that, although depressive symptoms were included as a control variable in all analyses, the effect of anxiety was not statistically controlled when evaluating the relationship between rumination, attachment orientation, interpersonal

behaviours, and social adjustment. Previous research indicates that there is a high level of co-morbidity between depression and anxiety (Starr & Davila, 2008a). Moreover, rumination is correlated with anxiety and prospectively predicts change in anxiety symptoms (Nolen-Hoeksema, 2000). Both anxiety, especially social anxiety, and depression have strong interpersonal components (Starr & Davila, 2008). Thus, this raises the possibility that the relationship between rumination and interpersonal behaviours is due to shared variance with anxiety.

Measures of anxiety were not collected from the sample 2 participants because it was deemed ethically unacceptable (due to participant burden) to administer the full SCID for this research study. Priority was given to evaluating depression, rumination and the key psychosocial measures. However, the full SCID and a measure of generalised anxiety symptoms (GAD) were administered to sample 3. The majority of sample 3 participants (60%, $n = 59$) had a co-morbid anxiety disorder at baseline, so that there was inadequate statistical power to be able to look at the sub-group of participants with 'pure depression' separately. However, it was possible to replicate the Study 2 analyses (evaluating the concurrent relationship between rumination and interpersonal style), controlling for both depressive symptoms and anxiety symptoms. The submissive interpersonal style retained a statistically significant relationship with rumination (brooding) controlling for depression and anxiety symptoms. Consistent with previous findings, generalised anxiety symptoms were also significantly associated with rumination (rumination and brooding, but not reflection).

A fourth limitation of the thesis was that the analyses only involved direct manipulation of one of the variables of interest (i.e., manipulation of rumination, but no

manipulation of interpersonal schema or styles). However, the hypothesised thesis model predicts that there is a bi-directional relationship, whereby rumination activates rejection sensitivity schema and fuels maladaptive (submissive and needy) interpersonal behaviours, and these interpersonal factors in turn fuel rumination. Thus, a limitation of the thesis, as a consequence of time and resource constraints, was that there was no empirical evaluation of this element of the model, i.e., the thesis did not investigate whether the experimental manipulation of rejection sensitivity and/or maladaptive interpersonal behaviour influences rumination. Clearly, manipulating both rumination and interpersonal variables is necessary in order to more fully unpack the causal relationship between rumination, maladaptive interpersonal schema and behaviours.

9.5 Future research directions

The hypothesised theoretical model of the interpersonal context of rumination (Figure 2.1) represents the first attempt to systematically organize converging findings that are relevant to understanding the interpersonal context of rumination into a unified conceptual framework. The results described in the preceding chapters of the thesis confirm aspects of this proposed model (Figure 9.1), whilst not confirming other elements of the model and generating new hypotheses regarding the relationship between rumination and adverse interpersonal consequences. The following section outlines some ways in which the interpersonal context of rumination might be further tested.

First, the thesis results leave open the possibility that rumination impairs social adjustment and generates increased chronic stress by inhibiting effective social perception and/or by distorting the way that individuals perceive their social milieu (Tse

& Bond, 2004, see section 9.2.2). This hypothesis could be tested experimentally by observing how a rumination induction using the standard rumination induction task (Nolen-Hoeksema & Morrow, 1993) influences behaviour during a social interaction. For example, Geerts and colleagues (Geerts, Bouhuys, & Vandenhoofdakker, 1996; Geerts, Bouhuys, & van Os, 2005) have developed an innovative and reliable method for assessing the degree of synchronicity in the behaviour of individuals in an interaction, labelled 'attunement', which could have value as a non self-report measure of social functioning. The approach involves systematically coding designated features of non-verbal and verbal behaviours which occur during a social interaction, and generating two behavioural components labelled 'speaking effort' (participant behaviour) and 'encouragement' (interviewer behaviour). Attunement is operationalized as the absolute difference between the interlocutors' behaviour. Previous findings indicate that poor levels of synchronisation between interviewee speaking effort and interviewer encouragement are associated with an unfavourable outcome of depression in both currently depressed (Geerts, et al., 1995, Geerts, Kouwert, Bouhuys, Meesters & Jansen, 2000) and remitted depressed participants (Bos, Bouhuys, Geerts, Van Os, & Ormel, 2006).

The earlier discussion has indicated that one of the mechanisms remaining to account for how rumination impairs interpersonal consequences is through inhibiting social perception and reducing sensitivity to other people's responses (Tse & Bond, 2004). Because attunement requires sensitivity and responsiveness to another person's interpersonal behaviour, it could provide an index of effective social responsiveness. Thus, it can be hypothesised that those dysphoric participants induced to ruminate would

exhibit lower levels of attunement than those who are distracted, during a social interaction that followed the induction.

Moreover, video recordings of the baseline and follow-up interviews were obtained from sample 2, with the intention of empirically testing the prediction that rumination is associated with poor attunement within the context of the current thesis. This data set potentially allows the testing of whether rumination is associated with poor attunement at Time 1, and whether rumination prospectively predicts worse attunement at Time 2, as well as whether poor attunement mediates the relationship between rumination and adverse social consequences such as chronic stress. Unfortunately, due to time constraints, the complexity and time-consuming nature of coding these recordings, and technical issues replicating the coding approach used by Geerts, et al., it was not feasible to undertake this element of the planned thesis research, but this would be an option for future research.

Earlier in the discussion (9.2.2) it was noted that rumination might generate adverse interpersonal consequences by negatively biasing how individuals interpret social cues. One method for assessing this could be to evaluate whether individuals who are induced to ruminate (compared to those induced to distract) exhibit a greater tendency to perceive negative emotions (i.e., rejection, sadness) in ambiguous faces using the perception of facial expressions questionnaire (Bouhuys, et al., 1995). Previous findings from a cross-sectional study (which used a clinically depressed sample, $N = 26$) indicated that rumination is significantly positively correlated with an increased tendency to perceive negative emotions in faces with ambiguous expressions (Raes, Hermans, & Williams, 2006) and it would be interesting to extend these findings using an

experimental design in order to establish whether rumination is causally implicated in a negative social perceptual bias interpreting facial expressions.

Another method which might be employed to test whether inducing rumination influences interpersonal behaviour could be the utilisation of a virtual reality environment. In a recent study (Freeman, et al., 2008), members of the general public entered a virtual reality train ride populated by neutral characters (they found that a substantial majority endorsed paranoid type concerns, which was predicted by anxiety, worry, perceptual anomalies and cognitive inflexibility). This paradigm lends itself to the study of the interpersonal context of rumination, because it provides a unique method for simulating interpersonal situations. Thus, this method could be adapted to test ways in which rumination influences how individuals respond socially. For example, the virtual reality environment might be set up so that the participants are required to elicit some form of assertive behaviour (e.g., you are required to look at a map on the wall of the train carriage as part of the experimental task but someone is blocking your view, somebody pushes in front of you in a cue undertaking a timed task to buy a ticket). It would be expected that individuals induced to ruminate would be less likely to feel comfortable eliciting the required assertive response undertaking these experimental tasks.

The discussion has highlighted that interpersonal problem solving is a possible mechanism which influences how rumination may impact social consequences. Previous experimental studies have already demonstrated that manipulating rumination influences problem solving (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, et al., 1999). However, further investigation could usefully be undertaken to examine the impact of

rumination on social problem solving in more realistic settings. The virtual reality paradigm could be employed to facilitate this. For example, individuals could be induced to either ruminate or distract and then engage in an imaginary social scenario necessitating the application of social problem solving skills.

Third, research should be undertaken to investigate whether the manipulation of interpersonal variables influences rumination. In particular, the current findings suggest that sensitivity to rejection may be a risk factor for increased rumination, and, as such, a logical next step is to manipulate the experience of rejection in an experimental analogue to determine whether it causally influences rumination. An experimental study in which rejection sensitivity is manipulated is necessary to substantiate this component of the model. Ayduk, Downey, Testa, Yen, and Shoda (1999) developed a novel experimental paradigm designed to induce rejection sensitivity. Participants are informed that they are participating in a study to investigate the formation of relationships on the internet in which they will be asked to 'chat' on-line with a potential dating partner. They are told that the experimenter will observe the on-line discussion on a third computer (the idea being that rejection in the presence of a peer increases impact). Participants write a short description of themselves before starting the task, which they are led to believe is given to the imaginary dating partner. In the experimental condition, participants are then told that they cannot continue with the interaction after the other person has read the description, because the other person has decided that they do not want to continue. In the control condition, participants are told that there is a technical problem which means that the procedure cannot continue. Kashdan and Roberts (2007) devised a measure of post-event rumination which could be used to evaluate how participants respond to this

simulated rejection event. Participants are asked to remember the event (in this case the interrupted on-line social interaction) and to report on their thoughts since that time. This method would provide a direct way of testing whether inducing rejection causally increases rumination. If the hypothesised model is correct, it would be expected that individuals in the experimental condition would exhibit more post-event rumination than those in the control condition.

The thesis findings supported the prediction that rejection sensitivity is a specific interpersonal schema which fuels rumination. However, it seems likely that other maladaptive beliefs about oneself and others might also contribute to rumination. Specifically, Nolen-Hoeksema et al. (2008) proposed that beliefs about one's inability to assert control over one's environment (helplessness schema) is a key factor which fuels rumination. Whilst this hypothesis was not directly tested, the finding that rumination is associated with the submissive interpersonal style and with increased chronic strain is consistent with this prediction. Future research, which might be undertaken in the context of clinical assessment and/or intervention work with depressed ruminators, could usefully involve a more detailed analysis of the relationship between core beliefs and rumination. Based on the converging theories discussed and in light of the thesis results which highlighted the association between rumination and the submissive interpersonal style, it is hypothesised that individuals who hold entrenched beliefs about the self as unlovable/likely to be rejected, and powerless to control external events are likely to be chronic ruminators.

Because the thesis research leaves unresolved the question of whether co-morbidity is a factor pertinent to understanding the psychosocial context of rumination,

this is another area which warrants further investigation. Collection of data assessing rumination, maladaptive interpersonal schema, interpersonal behaviours and social adjustment from a sample which comprised individuals with pure depression, individuals with social anxiety (but no depression) and those with both depression and social anxiety, and then comparing between-group differences would increase understanding of the impact of co-morbidity on the hypothesised model. Because previous findings indicate that the co-occurrence of depression and social anxiety results in the most intense and impairing levels of distress and social impairment (Erwin, Heimberg, Juster, & Mindlin, 2002), it would be expected that there would be significantly higher levels of rumination maladaptive interpersonal schema and behaviours in this sub-group.

The hypothesised thesis model does not facilitate understanding of why people develop maladaptive interpersonal schema and a ruminative response style. Indeed, there is little research examining the developmental antecedents of rumination. Although attachment theory provides a framework for understanding developmental antecedents of rejection sensitivity, to date no study has systematically examined childhood origins of rejection sensitivity as conceptualised via the ARSQ. Increasing understanding of why people become ruminators and sensitive to rejection is important because this could inform the development of interventions (e.g., parenting interventions, early intervention work with children and young people) which aim to prevent people from going on to become adult ruminators. Longitudinal research which examines developmental antecedents of rumination and rejection sensitivity, and which is not reliant on retrospective accounts, is required to increase understanding of developmental antecedents of rumination.

9.6 Implications for clinical intervention in depression

The thesis results have implications with regards to the assessment and treatment of depression. First, identifying that a patient is prone to rumination or detecting that they have an interpersonal style which is characterised by rejection-sensitivity and submissiveness, should alert clinicians to the likelihood that the other difficulty is present, prompting an assessment for this other difficulty, and further examination of the potential maintaining relationship between these cognitive and interpersonal factors when developing an individualised formulation. Moreover, assessment and formulation work with depressed ruminators should also involve exploring whether rumination is a factor contributing to the maintenance of chronic interpersonal stressors.

If an attachment orientation incorporating beliefs that one is unlovable/will be rejected by others underpin the tendency to ruminate, then cognitive therapy techniques which target negative core beliefs might be beneficial for depressed ruminators. Moreover, behavioural experiments which provide rejection-sensitive individuals with the opportunity to disconfirm their exaggerated expectations of rejection, or to practice using more adaptive coping strategies for dealing with rejection when it does occur, could provide a useful method for helping rejection-sensitive ruminators to become less sensitive to rejection and less likely to passively ruminate in response to rejection-related distress.

Conceptualizing rumination and submissiveness as forms of avoidance has implications for their clinical treatment. This idea is consistent with the notion that rumination is amenable to treatment via behavioural activation (Martell et al., 2001,

Watkins et al., 2007), which emphasizes understanding the avoidance function of rumination and then seeks to replace it with more helpful approach behaviours. If rumination contributes to depression via shared variance with the submissive interpersonal style, then this suggests that psychological interventions which specifically target passivity and avoidance such as Behavioural Activation (BA, Dimidjian et al., 2008) might be of benefit in terms of both reducing passive ruminative thinking and submissive behaviours. Finally, if rumination is a factor which contributes to the maintenance of interpersonal stress, then this suggests that interpersonal psychotherapy, with its focus on the interrelationship between mood and current life events should incorporate a consideration of the role of rumination in the maintenance of chronic interpersonal stress and the role of excessive reassurance-seeking in the generation of dependent life events.

Importantly, the findings reported in Chapter 8 suggest that a clinical intervention which specifically targeted rumination (Concreteness Training) resulted in a significantly greater reduction in overall reported interpersonal difficulties and submissive interpersonal behaviours than was reported by individuals in the Treatment-as-usual condition. This suggests that cognitive interventions can enhance interpersonal functioning. One possibility is that, whilst both CT and RT reduce rumination/brooding, the shift from rumination to a more action-oriented cognitive style in CT promotes interpersonal problem-solving and, thereby, is more effective at enhancing interpersonal functioning than relaxation, which acts to prevent the build-up of tension that triggers rumination. Consistent with this hypothesis, anecdotal evidence from the RCT indicates that those randomized to the CT condition commonly reported applying CT to deal with

difficult interpersonal situations. For example, one female patient reported using CT to problem-solve a recurring source of conflict with her partner (going out to the pub without her). By focusing on a recent occasion when this had occurred (focusing on the specific, contextual details of what happened and thinking about how she could move forwards from this situation in a constructive way), she was able to plan and then practice implementing a more adaptive strategy (discussing her feelings with her partner) when this situation arose again.

9.7 Final Summary

To conclude, in this thesis a theoretical model of the interpersonal context of rumination was proposed and tested. The findings support a specific pattern of relationship between rumination and maladaptive interpersonal style, in which rumination is associated with a maladaptive submissive interpersonal style (encapsulating overly-accommodating, non-assertive and self-sacrificing behaviours) but not with other (needy and cold) maladaptive interpersonal styles. Importantly, this finding was replicated in two different samples. Furthermore, the findings have important implications for the relevant theoretical models discussed (e.g., Lyubomirsky & Tkach, 2004; Tse & Bond, 2004). First, by demonstrating that rumination prospectively predicts diminished relationship satisfaction, poor social adjustment and chronic interpersonal stress, the thesis results support the hypothesis that rumination is a risk factor for poor interpersonal consequences, consistent with these models. Second, in Study 4 (Chapter 6), rumination was not a significant predictor of the submissive interpersonal style, neither was the submissive interpersonal style a predictor of increased rumination. Together, this pattern

of results suggests that rumination influences general adverse interpersonal consequences but not specific maladaptive interpersonal behaviours. These findings raise the possibility, which warrants further empirical evaluation, that rumination might negatively effect interpersonal functioning, not by increasing specific maladaptive interpersonal behaviours, but by inhibiting or negatively biasing social perception. However, in Study 6 (Chapter 8) an intervention which targeted rumination also reduced submissive interpersonal behaviours, raising the possibility that rumination may play a causal role in interpersonal behaviours (although this study was not able to rule out reduction in depression or other changes as the mediator of the improvement in interpersonal behaviour).

The combined thesis findings underscore the importance of conceptualizing depression as both a cognitive and interpersonal phenomenon. Highlighting the inter-relationship between cognitive and interpersonal mechanisms in depression: (a) rejection sensitivity emerged as a key interpersonal vulnerability factor which prospectively predicted increased rumination; (b), the effect of rumination on subsequent depression was mediated by the submissive interpersonal style, and (c) a cognitive intervention which targeted rumination improved interpersonal functioning. Thus, the thesis results indicate that clinical assessment and formulation work in depression should routinely and systematically evaluate the relationship between rumination and depressogenic interpersonal factors, particularly, rejection sensitivity, submissiveness, social adjustment and chronic interpersonal stress, as the basis for designing effective integrative interventions. Increasing our understanding of the role of rumination and interpersonal factors in depression forms part of a wider endeavour to develop programmes for treating

depression and preventing its recurrence, and it is hoped that the thesis makes a contribution towards achieving this important aim.

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Appendix 1: Thesis declaration

University of Exeter

Declaration for thesis: Chapter 3

Declaration by the candidate

In the case of Chapter 3 the extent and nature of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Formulation of study design. Data cleaning and preparation. Data analysis and interpretation and writing of the manuscript.	80%

The following co-authors contributed to the work:

Name	Nature of contribution
Professor Ed Watkins	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Professor Willem Kuyken	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Eugene Mullan	Consultation in formulation of the study design and data analysis and critical review of the manuscript.

Declaration by the candidate

In the case of Chapter 4 the extent and nature of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Formulation of study design. Data collection. Data cleaning and preparation. Data analysis and interpretation and writing of the manuscript.	85%

The following co-authors contributed to the work:

Name	Nature of contribution
Professor Ed Watkins	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Eugene Mullan	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Nick Moberly	Consultation in formulation of the study design and data analysis and critical review of the manuscript.

Declaration by the candidate

In the case of Chapter 5 the extent and nature of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Formulation of study design. Data collection. Data cleaning and preparation. Data analysis and interpretation and writing of the manuscript.	90%

The following co-authors contributed to the work:

Name	Nature of contribution
Professor Ed Watkins	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Eugene Mullan	Consultation in formulation of the study design and data analysis and critical review of the manuscript.

Declaration by the candidate

In the case of Chapter 6 the extent and nature of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Formulation of study design. Data collection. Data cleaning and preparation. Data analysis and interpretation and writing of the manuscript.	90%

The following co-authors contributed to the work:

Name	Nature of contribution
Professor Ed Watkins	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Eugene Mullan	Consultation in formulation of the study design and data analysis and critical review of the manuscript.

Declaration by the candidate

In the case of Chapter 7 the extent and nature of my contribution to the work was the following:

Nature of contribution	Extent of contribution
Formulation of study design. Data collection. Data cleaning and preparation. Data analysis and interpretation and writing of the manuscript.	90%

The following co-authors contributed to the work:

Name	Nature of contribution
Professor Ed Watkins	Consultation in formulation of the study design and data analysis and critical review of the manuscript.
Doctor Eugene Mullan	Consultation in formulation of the study design and data analysis and critical review of the manuscript.

Kate Pearson

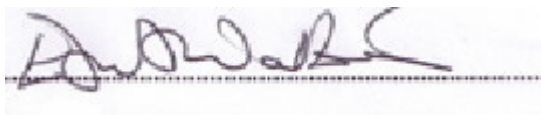
Candidate signature:

Date: 03/04/10

Declaration by supervisor:

The undersigned certifies that:

- 1) The above declarations correctly reflect the nature and extent of the candidate's contribution to the work, and the nature of the contribution of each of the co-authors.
- 2) The candidate meets the criteria for first author on each paper in that they have participated in the conception, execution and interpretation of the manuscript.
- 3) They take public responsibility for the overall responsibility for the publication.
- 4) There are no other authors of the publication according to these criteria; and
- 5) There were no potential conflicts of interest.

A handwritten signature in black ink, appearing to read "Ed Watkins", is written over a horizontal dashed line.

Signed:

Professor Ed Watkins

Date:

Appendix 2: Thesis measures

BECK DEPRESSION INVENTORY – II (BDI-II)

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, then pick out the **one statement** in each group which best describes the way you have been feeling during the **past 2 weeks, including today**. Circle the number beside the statement you have picked.

If several statements in the group seem to apply equally well, simply circle the statement which has the largest number. Be sure that you do **not** circle more than one statement for Item 16 (Change in sleeping pattern) and Item 18 (Change in appetite.)

1 Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2 Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3 Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4 Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5 Guilty Feelings

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6 Punishment Feelings

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7 Self Dislike

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8 Self Criticalness

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9 Suicidal Thoughts or Wishes

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10 Crying

- 0 I don't cry any more than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying but I can't.

11 Agitation

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated I have to keep moving or doing something.

12 Loss of Interest

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

13 Indecisiveness

- 0** I make decisions about as well as ever.
- 1** I find it more difficult to make decisions than usual.
- 2** I have much greater difficulty in making decisions than I used to.
- 3** I have trouble making any decisions.

14 Worthlessness

- 0** I do not feel I am worthless.
- 1** I don't consider myself as worthwhile or useful as I used to.
- 2** I feel more worthless as compared to other people.
- 3** I feel utterly worthless.

15 Loss of Energy

- 0** I have as much energy as ever.
- 1** I have less energy than I used to have.
- 2** I don't have enough energy to do very much.
- 3** I don't have enough energy to do anything.

16 Change in Sleeping Pattern

- 0** I have not experienced any change in my sleeping pattern.

-
- 1a** I sleep somewhat more than usual.
 - 1b** I sleep somewhat less than usual.

-
- 2a** I sleep a lot more than usual.
 - 2b** I sleep a lot less than usual.

-
- 3a** I sleep most of the day.
 - 3b** I wake up 1-2 hours early and can't get back to sleep.

17 Irritability

- 0** I am no more irritable than usual.
- 1** I am more irritable than usual.
- 2** I am much more irritable than usual.
- 3** I am irritable all the time.

18 Change in Appetite

- 0** I have not experienced any change in my appetite.

-
- 1a** My appetite is somewhat less than usual.
 - 1b** My appetite is somewhat greater than usual.

-
- 2a** My appetite is much less than before.
 - 2b** My appetite is much greater than usual.

-
- 3a** I have no appetite at all.
 - 3b** I crave food all the time.

19 Concentration Difficulty

- 0** I can concentrate as well as ever.
- 1** I can't concentrate as well as usual.
- 2** It's hard to keep my mind on anything for very long.
- 3** I find I can't concentrate on anything.

20 Tiredness or Fatigue

- 0** I am no more tired or fatigued than usual.
- 1** I get more tired or fatigued more easily than usual.
- 2** I am too tired or fatigued to do a lot of things I used to do.
- 3** I am too tired or fatigued to do most of the things I used to do.

21 Loss of Interest in Sex

- 0** I have not noticed any recent change in my interest in sex.
- 1** I am less interested in sex than I used to be.
- 2** I am much less interested in sex now.
- 3** I have lost interest in sex completely.

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RRS

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

	Almost Never	Some- times	Often	Almost Always
1. Think about how alone you feel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Think "I won't be able to do my job/work because I feel so bad"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Think about your feelings of fatigue and achiness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Think about how hard it is to concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Think about how passive and unmotivated you feel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Analyse recent events to try and understand why you are depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Think about how you don't seem to feel anything anymore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Think "Why can't I get going?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Think "Why do I always react this way?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Go away by yourself and think about why you feel this way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Write what you are thinking about and analyse it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Think about a recent situation, wishing it would have gone better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Think "Why do I have problems other people don't have?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Think about how sad you feel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Think about all your shortcomings, failings, faults and mistakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Think about how you don't feel up to doing anything	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Analyse your personality to try and understand why you are depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Go someplace alone to think about your feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Think about how angry you are with yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Listen to sad music	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Isolate yourself and think about the reasons why you feel sad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Try to understand yourself by focusing on your depressed mood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Think "What am I doing to deserve this?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Think "I won't be able to concentrate if I keep feeling this way"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Think "Why can't I handle things better?"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IIP-64 Question Sheet

Name: _____

Date: ____ / ____ / ____ Sex: Male Female

Month Day Year

Page 1

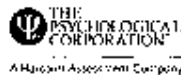
People have reported having the following problems in relating to other people. Please read the list below, and for each item, consider whether it has been a problem for you with respect to any significant person in your life. Then fill in the numbered circle that describes how distressing that problem has been.

The following are things you find hard to do with other people.

It is hard for me to:

1. Trust other people
2. Say "no" to other people
3. Join in on groups
4. Keep things private from other people
5. Let other people know what I want
6. Tell a person to stop bothering me
7. Introduce myself to new people
8. Confront people with problems that come up
9. Be assertive with another person
10. Let other people know when I am angry
11. Make a long-term commitment to another person
12. Be another person's boss
13. Be aggressive toward other people when the situation calls for it
14. Socialize with other people
15. Show affection to people
16. Get along with people
17. Understand another person's point of view
18. Express my feelings to other people directly
19. Be firm when I need to be
20. Experience a feeling of love for another person
21. Set limits on other people
22. Be supportive of another person's goals in life
23. Feel close to other people
24. Really care about other people's problems
25. Argue with another person
26. Spend time alone
27. Give a gift to another person
28. Let myself feel angry at somebody I like
29. Put somebody else's needs before my own
30. Stay out of other people's business
31. Take instructions from people who have authority over me
32. Feel good about another person's happiness
33. Ask other people to get together socially with me

	Not at all	A little bit	Modestly	Quite a bit	Extremely	
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	1.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	2.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	3.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	4.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	5.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	6.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	7.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	8.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	9.
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	10.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	11.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	12.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	13.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	14.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	15.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	16.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	17.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	18.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	19.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	20.
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	21.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	22.
<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	23.
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<input type="radio"/> 0	<input type="radio"/> 0	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	26.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	27.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	28.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	29.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	30.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	31.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	32.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	33.



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456789 101112 ABCDE

0158132521

It is hard for me to:

34. Feel angry at other people
 35. Open up and tell my feelings to another person
 36. Forgive another person after I've been angry
 37. Attend to my own welfare when somebody else is needy
 38. Be assertive without worrying about hurting the other person's feelings
 39. Be self-confident when I am with other people

The following are things that you do too much.

40. I fight with other people too much.
 41. I feel too responsible for solving other people's problems.
 42. I am too easily persuaded by other people.
 43. I open up to people too much.
 44. I am too independent.
 45. I am too aggressive toward other people.
 46. I try to please other people too much.
 47. I clown around too much.
 48. I want to be noticed too much.
 49. I trust other people too much.
 50. I try to control other people too much.
 51. I put other people's needs before my own too much.
 52. I try to change other people too much.
 53. I am too gullible.
 54. I am overly generous to other people.
 55. I am too afraid of other people.
 56. I am too suspicious of other people.
 57. I manipulate other people too much to get what I want.
 58. I tell personal things to other people too much.
 59. I argue with other people too much.
 60. I keep other people at a distance too much.
 61. I let other people take advantage of me too much.
 62. I feel embarrassed in front of other people too much.
 63. I am affected by another person's misery too much.
 64. I want to get revenge against people too much.

	Not at all	A little bit	Moderately	Quite a bit	Extremely	
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		34.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		35.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		36.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		37.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		38.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		39.
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<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		41.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		42.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		43.
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<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		46.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		47.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		48.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		49.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		50.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		51.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		52.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		53.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		54.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		55.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		56.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		57.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		58.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		59.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		60.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		61.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		62.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		63.
<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4		64.

IIP-32

Listed below are a variety of common problems that people report in relating to other people. Please read each one and consider whether that problem has been a problem for you with respect to any significant person in your life. Then tick the box which best describes *how distressing* that problem has been.

Part I. The following are things you find hard to do with other people.

It is hard for me to...	Not at all	A little bit	Moderately	Quite a bit	Extremely
	0	1	2	3	4
1. Say "no" to other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Join in on groups.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Keep things private from other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Tell a person to stop bothering me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Introduce myself to new people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Confront people with problems that come up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Be assertive with another person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Let other people know when I am angry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Socialize with other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Show affection to people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Get along with people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Be firm when I need to be.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Experience a feeling of love for another person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Be supportive of another person's life goals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Feel close to other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Really care about another person's problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Put somebody else's needs before my own.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Feel good about another person's happiness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Ask other people to get together socially with me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Be assertive without worrying about hurting other's feelings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part II. The following are things that you do too much.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
	0	1	2	3	4
21. I open up to people too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I am too aggressive toward other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I try to please other people too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I want to be noticed too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. I try to control other people too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. I put other people's needs before my own too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. I am overly generous to other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I manipulate other people too much to get what I want.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. I tell personal things to other people too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I argue with other people too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. I let other people take advantage of me too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I am affected by another person's misery too much.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DIRI

The following questions ask about your style of interacting socially with other people. For each question, please circle the number most appropriate to you.

- 1 In general, do you find yourself often asking the people you feel close to how they truly feel about you?**

No, not at all	No, hardly ever	Not really	I'm not sure	Yes, somewhat	Yes, quite often	Yes, very much
1	2	3	4	5	6	7

- 2 In general, do you frequently seek reassurance from the people you feel close to as to whether they really care about you?**

No, not at all	No, hardly ever	Not really	I'm not sure	Yes, somewhat	Yes, quite often	Yes, very much
1	2	3	4	5	6	7

- 3 In general, do the people you feel close to sometimes become irritated with you for seeking reassurance from them about whether they really care about you?**

No, not at all	No, hardly ever	Not really	I'm not sure	Yes, somewhat	Yes, quite often	Yes, very much
1	2	3	4	5	6	7

- 4 In general, do the people you feel close to sometimes get "fed up" with you for seeking reassurance from them about whether they really care about you?**

No, not at all	No, hardly ever	Not really	I'm not sure	Yes, somewhat	Yes, quite often	Yes, very much
1	2	3	4	5	6	7

ARSQ

The items below describe situations in which people sometimes ask things of others. For each item, imagine you are in the situation and then answer the questions that follow it, by putting a circle around the number most appropriate to you.

1 You ask your parents or another family member for a loan to help you through a difficult financial time.

How concerned or anxious would you be over whether or not your family would want to help you?	Very unconcerned	1	2	3	4	5	Very concerned	6
I would expect that they would agree to help as much as they can.	Very unlikely	1	2	3	4	5	Very likely	6

2 You approach a close friend to talk after doing or saying something that seriously upset him/her.

How concerned or anxious would you be over whether or not your friend would want to talk with you?	Very unconcerned	1	2	3	4	5	Very concerned	6
I would expect that he/she would want to talk to with me to try to work things out.	Very unlikely	1	2	3	4	5	Very likely	6

3 You bring up the issue of sexual protection with your partner and tell him/her how important you think it is.

How concerned or anxious would you be over his/her reaction?	Very unconcerned	1	2	3	4	5	Very concerned	6
I would expect that he/she would be willing to discuss our possible options without getting defensive.	Very unlikely	1	2	3	4	5	Very likely	6

4 You ask your supervisor for help with a problem you have been having at work.

How concerned or anxious would you be over whether or not the person would want to help you?	Very unconcerned	1	2	3	4	5	Very concerned	6
I would expect that he/she would want to try to help me out.	Very unlikely	1	2	3	4	5	Very likely	6

5 After a bitter argument, you call or approach your partner because you want to make up.

How concerned or anxious would you be over whether or not your partner would want to make up with you?	Very unconcerned	1	2	3	4	5	Very concerned	6
I would expect that he/she would be at least as eager to make up as I would be.	Very unlikely	1	2	3	4	5	Very likely	6

6 You ask your parents or other family members to come to an occasion important to you.

How concerned or anxious would you be over whether or not they would want to come?

	Very unconcerned						Very concerned
	1	2	3	4	5		6

I would expect that they would want to come.

	Very unlikely						Very likely
	1	2	3	4	5		6

7 At a party you notice someone on the other side of the room that you'd like to get to know, and you approach him or her to try and start a conversation.

How concerned or anxious would you be over whether or not the person would want to talk with you?

	Very unconcerned						Very concerned
	1	2	3	4	5		6

I would expect that he/she would want to talk to me.

	Very unlikely						Very likely
	1	2	3	4	5		6

8 Lately you've been noticing some distance between yourself and your partner, and you ask him/her whether there is something wrong.

How concerned or anxious would you be over whether or not he/she still loves you and wants to be with you?

	Very unconcerned						Very concerned
	1	2	3	4	5		6

I would expect that he/she will show sincere love and commitment to our relationship no matter what else may be going on.

	Very unlikely						Very likely
	1	2	3	4	5		6

9 You call a friend when there is something on your mind that you feel you really need to talk about.

How concerned or anxious would you be over whether or not your friend would want to listen?

	Very unconcerned						Very concerned
	1	2	3	4	5		6

I would expect that he/she would listen and support me.

	Very unlikely						Very likely
	1	2	3	4	5		6

SAS - SR

We are interested in finding out how you have been doing the last 2 weeks. We would like you to answer some questions about your work, your spare time, and your family life. There are no right or wrong answers to these questions. Answer the questions by ticking the box which corresponds to your answer.

A. Work for Pay

Do you work 15 hours or more per week for pay?

If **YES**, please answer Question 1. If **NO**, skip to section B. Housework (unpaid).

1. How many days did you miss from work in the past 2 weeks?

- 1. I didn't miss any days.
- 2. I missed one day.
- 3. I missed about half the time.
- 4. I missed more than half the time but did work at least 1 day.
- 5. I did not work any days.
- 6. I did not work any days because of scheduled vacation.

Did you work any days in the last 2 weeks?

If **YES**, please answer Questions 2 through 6. If **NO**, skip to section B. Housework (unpaid).

2. How well have you been able to do your work in the last 2 weeks?

- 1. I did my work very well.
- 2. I did my work well but had some minor problems.
- 3. I needed help with work and did not do well about half the time.
- 4. I did my work poorly most of the time.
- 5. I did my work poorly all the time.

3. How often have you been ashamed of how you did your work in the last 2 weeks?

- 1. I have never felt ashamed.
- 2. Once or twice I felt a little ashamed.
- 3. About half the time I felt ashamed.
- 4. I felt ashamed most of the time.
- 5. I felt ashamed all the time.

4. Have you had any arguments with people at work in the last 2 weeks?

- 1. I had no arguments and got along very well.
- 2. I usually got along well but had minor arguments.
- 3. I had more than one argument.
- 4. I had many arguments.
- 5. I was constantly having arguments.

5. How often have you felt upset, worried, or uncomfortable while doing your work during the last 2 weeks?

- 1. I never felt upset.
- 2. Once or twice I felt upset.
- 3. Half the time I felt upset.
- 4. I felt upset most of the time.
- 5. I felt upset all the time.

6. How often have you found your work interesting these last 2 weeks?

- 1. My work was almost always interesting.
- 2. Once or twice my work was uninteresting.
- 3. Half the time my work was uninteresting.
- 4. Most of the time my work was uninteresting.
- 5. My work was always uninteresting.

B. Housework (unpaid)

Is unpaid housework a significant activity in your life?

If **YES**, please answer Question 7. If **NO**, skip to section C. Student.

7. How often did you do some unpaid housework (e.g., cooking, cleaning, laundry, grocery shopping, and errands) in the past 2 weeks?

- 1. I did the housework every day.
- 2. I did the housework almost every day.
- 3. I did the housework about half the time.
- 4. I did not usually do the housework.
- 5. I was completely unable to do the housework.
- 6. I was away from home all of the last 2 weeks.

Were you away from home all of the last 2 weeks?

If **YES**, skip to section C. Student. If **NO**, please answer Questions 8 through 12.

8. During the last 2 weeks, how well did you do your housework?

- 1. I did my work very well.
- 2. I did my work well but had some minor problems.
- 3. I needed help with work and did not do well about half the time.
- 4. I did my work poorly most of the time.
- 5. I did my work poorly all the time.

9. How often have you been ashamed of how you did your housework in the last 2 weeks?

- 1. I have never felt ashamed.
- 2. Once or twice I felt a little ashamed.
- 3. About half the time I felt ashamed.
- 4. I felt ashamed most of the time.
- 5. I felt ashamed all the time.

10. Have you had any arguments with salespeople, repair persons, or neighbours in the last 2 weeks?

- 1. I had no arguments and got along very well.
- 2. I usually got along well but had minor arguments.
- 3. I had more than one argument.
- 4. I had many arguments.
- 5. I was constantly having arguments.

11. How often have you felt upset while doing your housework during the last 2 weeks?

- 1. I never felt upset.
- 2. Once or twice I felt upset.
- 3. Half the time I felt upset.
- 4. I felt upset most of the time.
- 5. I felt upset all the time.

12. How often have you found your housework interesting these last 2 weeks?

- 1. My work was almost always interesting.
- 2. Once or twice my work was uninteresting.
- 3. Half the time my work was uninteresting.
- 4. Most of the time my work was uninteresting.
- 5. My work was always uninteresting.

C. Student

Do you attend school at least half-time?

If **YES**, please answer Questions 13 through 18. If **NO**, skip to section D. Social and Leisure.

13. How many days of classes did you miss in the past 2 weeks?

- 1. I didn't miss any days.
- 2. I missed one day.
- 3. I missed about half the time.
- 4. I missed more than half the time but did attend class at least 1 day.
- 5. I did not go to classes at all.
- 6. I was on vacation all of the last 2 weeks.

14. How well have you been able to keep up with your schoolwork in the last 2 weeks?

- 1. I did my schoolwork very well.
- 2. I did my schoolwork well but had some minor problems.
- 3. I needed help with schoolwork and did not do well about half the time.
- 4. I did my schoolwork poorly most of the time.
- 5. I did my schoolwork poorly all the time.

15. During the last 2 weeks, how often have you been ashamed of how you did your schoolwork?

- 1. I never felt ashamed.
- 2. Once or twice I felt a little ashamed.
- 3. About half the time I felt ashamed.
- 4. I felt ashamed most of the time.
- 5. I felt ashamed all the time.

16. Have you had any arguments with people at school in the last 2 weeks?

- 1. I had no arguments and got along very well.
- 2. I usually got along well but had minor arguments.
- 3. I had more than one argument.
- 4. I had many arguments.
- 5. I was constantly having arguments.
- 6. Not applicable: I did not attend school.

17. How often did you feel upset at school during the last 2 weeks?

- 1. I never felt upset.
- 2. Once or twice I felt upset.
- 3. Half the time I felt upset.
- 4. I felt upset most of the time.
- 5. I felt upset all the time.
- 6. Not applicable: I did not attend school.

18. How often have you found your schoolwork interesting these last 2 weeks?

- 1. My schoolwork was almost always interesting.
- 2. Once or twice my schoolwork was uninteresting.
- 3. Half the time my schoolwork was uninteresting.
- 4. Most of the time my schoolwork was uninteresting.
- 5. My schoolwork was always uninteresting.

D. Social and Leisure

Everyone please answer Questions 19 through 27.

19. How many friends have you seen or been in contact with (e.g., on the telephone, via e-mail, etc.) in the last 2 weeks?

- 1. Nine or more friends.
- 2. Five to eight friends.
- 3. Two to four friends.
- 4. One friend.
- 5. No friends.

20. How often have you been able to talk about your feelings and problems with one of your friends during the last 2 weeks?

- 1. I was always able to talk about my innermost feelings.
- 2. I was usually able to talk about my feelings.
- 3. About half the time I was able to talk about my feelings.
- 4. I was not usually able to talk about my feelings.
- 5. I was never able to talk about my feelings.
- 6. Not applicable: I have no friends.

21. How many times in the last 2 weeks have you gone out socially with other people, for example, visited friends; gone to movies, bowling, church, or restaurants; or invited friends to your home?

- 1. More than three times.
- 2. Three times.
- 3. Twice.
- 4. Once.
- 5. None.

22. How much time have you spent on hobbies or spare-time interests during the last 2 weeks? For example, have you been gardening, playing sports, listening to music, reading, or using the computer?

- 1. I spent most of my spare time on hobbies every day.
- 2. I spent some of my spare time on hobbies some of the days.
- 3. I spent a little of my spare time on hobbies.
- 4. I did not usually spend any time on hobbies but did watch TV.
- 5. I did not spend any spare time on hobbies or watching TV.

23. Have you had any open arguments with your friends in the last 2 weeks?

- 1. I had no arguments and got along very well.
- 2. I usually got along well but had minor arguments.
- 3. I had more than one argument.
- 4. I had many arguments.
- 5. I was constantly having arguments.
- 6. Not applicable: I have no friends.

24. If your feelings were hurt or offended by a friend during the last 2 weeks, how did you take it?

- 1. It did not affect me or it did not happen.
- 2. I got over it in a few hours.
- 3. I got over it in a few days.
- 4. I got over it in a week.
- 5. It will take me months to recover.
- 6. Not applicable: I have no friends.

25. How often have you felt shy or uncomfortable with people in the last 2 weeks?

- 1. I always felt comfortable.
- 2. Sometimes I felt uncomfortable but I could relax after a while.
- 3. About half the time I felt uncomfortable.
- 4. I usually felt uncomfortable.
- 5. I always felt uncomfortable.
- 6. Not applicable: I was never with people during the last two weeks.

26. How often have you felt lonely and wished for more friends during the last 2 weeks?

- 1. I have not felt lonely.
- 2. I have felt lonely a few times.
- 3. I felt lonely about half the time.
- 4. I usually felt lonely.
- 5. I always felt lonely and wished for more friends.

27. How often have you felt bored in your spare time during the last 2 weeks?

- 1. I never felt bored.
- 2. I did not usually feel bored.
- 3. About half the time I felt bored.
- 4. Most of the time I felt bored.
- 5. I was constantly bored.

Are you a single, separated, or divorced person not living with a partner?

If **YES**, please answer Questions 28 and 29. If **NO**, skip to section E. Family Outside the Home.

28. How many times have you been on a date these past 2 weeks?

- 1. More than three times.
- 2. Three times.
- 3. Twice.
- 4. Once.
- 5. Never.

29. Have you been interested in dating during the last 2 weeks? If you have not dated, would you have liked it?

- 1. I was always interested in dating.
- 2. Most of the time I was interested.
- 3. About half the time I was interested.
- 4. Most of the time I was not interested.
- 5. I was completely uninterested.

E. Family Outside the Home

Answer Questions 30 through 37 about your parents, brothers, sisters, in-laws, and children not living at home.

Have you been in contact with Any of them in the last 2 weeks?

If **YES**, please answer Questions 30 through 37. If **NO**, skip to question 36.

30. Have you had any open arguments with your relatives in the last 2 weeks?

- 1. We always got along very well.
- 2. We usually got along very well but had some minor arguments.
- 3. I had more than one argument with at least one relative.
- 4. I had many arguments.
- 5. I was constantly having arguments.

31. How often have you been able to talk about your feelings and problems with one of your relatives in the last 2 weeks?

- 1. I was always able to talk about my feelings with at least one relative.
- 2. I was usually able to talk about my feelings.
- 3. About half the time I was able to talk about my feelings.
- 4. I was not usually able to talk about my feelings.
- 5. I was never able to talk about my feelings.

32. Have you avoided contact with your relatives these last 2 weeks?

- 1. I have contacted relatives regularly.
- 2. I have contacted a relative at least once.
- 3. I have waited for my relatives to contact me.
- 4. I have avoided my relatives, but they contacted me.
- 5. I have no contact with any relatives.

33. Did you depend on your relatives for help, advice, money, or friendship during the last 2 weeks?

- 1. I never needed to depend on them.
- 2. I did not usually need to depend on them.
- 3. About half the time I needed to depend on them.
- 4. Most of the time I depended on them.
- 5. I depended completely on them.

34. During the last 2 weeks, how often have you wanted to do the opposite of what your relatives wanted in order to make them angry?

- 1. I never wanted to oppose them.
- 2. Once or twice I wanted to oppose them.
- 3. About half the time I wanted to oppose them.
- 4. Most of the time I wanted to oppose them.
- 5. I always opposed them.

35. How often have you been worried about things happening to your relatives without good reason in the last 2 weeks?

- 1. I have not worried without reason.
- 2. Once or twice I worried.
- 3. About half the time I worried.
- 4. Most of the time I worried.
- 5. I have worried the entire time.

Everyone answer Questions 36 and 37, even if your relatives are not living.

36. During the last 2 weeks, how often have you been thinking that you have let any of your relatives down or been unfair to them at any time?

- 1. I did not feel that I let them down at all.
- 2. I usually did not feel that I let them down.
- 3. About half the time I felt that I let them down.
- 4. Most of the time I felt that I let them down.
- 5. I always felt that I let them down.

37. During the last 2 weeks, how often have you been thinking that any of your relatives have let you down or have been unfair to you at any time?

- 1. I never felt that they let me down.
- 2. I felt that they usually did not let me down.
- 3. About half the time I felt they let me down.
- 4. I usually felt that they let me down.
- 5. I feel bitter that they let me down.

F. Primary Relationship

Are you living with your spouse or have you been living in an intimate relationship?
 If **YES**, please answer Questions 38 through 46. If **NO**, skip to section G. Parental.

38. Have you had any open arguments with your partner in the last 2 weeks?

- 1. We had no arguments, and we got along well.
- 2. We usually got along well but had minor arguments.
- 3. We had more than one argument.
- 4. We had many arguments.
- 5. We were constantly having arguments.

39. How often have you been able to talk about your feelings and problems with your partner during the last 2 weeks?

- 1. I could always talk freely about my feelings.
- 2. I could usually talk about my feelings.
- 3. About half the time I felt able to talk about my feelings.
- 4. I was not usually able to talk about my feelings.
- 5. I was never able to talk about my feelings.

40. How often have you been demanding to have your own way at home during the last 2 weeks?

- 1. I have not insisted on always having my own way.
- 2. I have not usually insisted on having my own way.
- 3. About half the time I insisted on having my own way.
- 4. I usually insisted on having my own way.
- 5. I always insisted on having my own way.

41. How often have you been bossed around by your partner these last 2 weeks?

- 1. Almost never.
- 2. Once in a while.
- 3. About half the time.
- 4. Most of the time.
- 5. Always.

42. How much have you felt dependent on your partner these last 2 weeks?

- 1. I was independent.
- 2. I was usually independent.
- 3. I was somewhat dependent.
- 4. I was usually dependent.
- 5. I depended on my partner for everything.

43. How have you felt about your partner during the last 2 weeks?

- 1. I always felt affection.
- 2. I usually felt affection.
- 3. About half the time I felt dislike and half the time affection.
- 4. I usually felt dislike.
- 5. I always felt dislike.

44. How many times have you and your partner had sex?

- 1. More than twice a week.
- 2. Once or twice a week.
- 3. Once every 2 weeks.
- 4. Less than once every 2 weeks, but at least once in the last month.
- 5. Not at all in a month or longer.

45. Have you had any problems during sex, such as pain, these last 2 weeks?

- 1. None.
- 2. Once or twice.
- 3. About half the time.
- 4. Most of the time.
- 5. Always.
- 6. Not applicable: No sex in the last 2 weeks.

46. How have you felt about sex during the last 2 weeks?

- 1. I always enjoyed it.
- 2. I usually enjoyed it.
- 3. About half the time I enjoyed it, and half the time I did not.
- 4. I usually did not enjoy it.
- 5. I never enjoyed it.
- 6. Not applicable: No sex in the last 2 weeks.

G. Parental

Have you had unmarried children, stepchildren, or foster children living at home during the last 2 weeks?
If YES, please answer Questions 47 through 50. If NO, skip to section H. Family Unit.

47. How often have you been interested in what your children are doing – school, play, or hobbies - during the last 2 weeks?

- 1. I was always interested and actively involved.
- 2. I was usually interested and involved.
- 3. I was interested about half the time and uninterested half the time.
- 4. I was usually uninterested.
- 5. I was always uninterested.

**48. Have you been able to talk and listen to your children during the last 2 weeks?
(Include only children over the age of 2)**

- 1. I was always able to communicate with them.
- 2. I was usually able to communicate with them.
- 3. About half the time I could communicate.
- 4. I was not usually able to communicate.
- 5. I was completely unable to communicate.
- 6. Not applicable: No children over the age of 2.

49. How have you been getting along with your children during the last 2 weeks?

- 1. I had no arguments and got along very well.
- 2. I usually got along well but had minor arguments.
- 3. I had more than one argument.
- 4. I had many arguments.
- 5. I was constantly having arguments.

50. How have you felt toward your children these last 2 weeks?

- 1. I always felt affection.
- 2. I usually felt affection.
- 3. About half the time I felt affection.
- 4. Most of the time I did not feel affection.
- 5. I never felt affection toward them.

H. Family Unit

Have you ever been married, ever lived with a partner in an intimate relationship, or ever had children?
 If **YES**, please answer Questions 51 through 54. If **NO**, skip to Question 54.

51. Have you worried about your partner or any of your children without any reason during the last 2 weeks, even if you are not living together now?

- 1. I never worried.
- 2. Once or twice I worried.
- 3. About half the time I worried.
- 4. Most of the time I worried.
- 5. I always worried.
- 6. Not applicable: Partner and children not living.

52. During the last 2 weeks, have you been thinking that you have let down your partner or any of your children at any time?

- 1. I did not feel I let them down at all.
- 2. I did not usually feel that I let them down.
- 3. About half the time I felt I let them down.
- 4. Most of the time I felt that I let them down.
- 5. I let them down completely.

53. During the last 2 weeks, have you been thinking that your partner or any of your children have let you down at any time?

- 1. I never felt that they let me down.
- 2. I did not usually feel that they let me down.
- 3. About half the time I felt that they let me down.
- 4. I usually felt that they let me down.
- 5. I feel bitter that they have let me down.

Everyone please answer Question 54.

54. Have you had enough money to take care of your own and your immediate family's financial needs during the last 2 weeks?

- 1. I had enough money for needs.
- 2. I usually had enough money with minor problems.
- 3. About half the time I did not have enough money but did not have to borrow money.
- 4. I usually did not have enough money and had to borrow from others.
- 5. I had great financial difficulty.

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems? <i>(Circle the number to indicate your answer)</i>	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Experiences in Close Relationships Questionnaire - Revised (ECR-R)

The following statements concern how you feel in emotionally intimate relationships. We are interested in how you generally experience relationships, not just what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. For each statement, please circle the number most appropriate to you.

- | | | | | | | | | |
|-----------|---|---|---|-------------------|---|---|---|----------------|
| 1 | I'm afraid that I will lose my partner's love. | | | | | | | |
| | Disagree strongly | | | Neutral/
Mixed | | | | Agree strongly |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 2 | I prefer not to show a partner how I feel deep down. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 3 | I often worry that my partner will not want to stay with me. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 4 | I feel comfortable sharing my private thoughts and feelings with my partner. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 5 | I often worry that my partner doesn't really love me. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 6 | I find it difficult to allow myself to depend on romantic partners. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 7 | I worry that romantic partners won't care about me as much as I care about them. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 8 | I am very comfortable being close to romantic partners. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 9 | I often wish that my partner's feelings for me were as strong as my feelings for him or her. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 10 | I don't feel comfortable opening up to romantic partners. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 11 | I worry a lot about my relationships. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 12 | I prefer not to be too close to romantic partners. | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 13 | When my partner is out of sight, I worry that he or she might become interested in someone else. | | | | | | | |

- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 14 I get uncomfortable when a romantic partner wants to be very close.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 15 When I show my feelings for romantic partners, I'm afraid they will not feel the same about me.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 16 I find it relatively easy to get close to my partner.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 17 I rarely worry about my partner leaving me.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 18 It's not difficult for me to get close to my partner.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 19 My partner makes me doubt myself.
- | | | | | | | | |
|-------------------|---|---|---|-------------------|---|---|----------------|
| Disagree strongly | | | | Neutral/
Mixed | | | Agree strongly |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
- 20 I usually discuss my problems and concerns with my partner.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 21 I do not often worry about being abandoned.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 22 It helps to turn to my romantic partner in times of need.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 23 I find that my partner(s) don't want to get as close as I would like.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 24 I tell my partner just about everything.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 25 Sometimes romantic partners change their feelings about me for no apparent reason.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 26 I talk things over with my partner.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 27 My desire to be very close sometimes scares people away.
- | | | | | | | | |
|--|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--|---|---|---|---|---|---|---|
- 28 I am nervous when partners get too close to me.

Please turn over

	1	2	3	4	5	6	7
29	I'm afraid that once a romantic partner gets to know me, he or she won't like who I really am.						
	1	2	3	4	5	6	7
30	I feel comfortable depending on romantic partners.						
	1	2	3	4	5	6	7
31	It makes me mad that I don't get the affection and support I need from my partner.						
	1	2	3	4	5	6	7
32	I find it easy to depend on romantic partners.						
	1	2	3	4	5	6	7
33	I worry that I won't measure up to other people.						
	1	2	3	4	5	6	7
34	It's easy for me to be affectionate with my partner.						
	1	2	3	4	5	6	7
35	My partner only seems to notice me when I'm angry.						
	1	2	3	4	5	6	7
36	My partner really understands me and my needs.						
	1	2	3	4	5	6	7

Appendix 3: Ethics documentation

Participant Information Sheet: The social context of depression

Principal investigator: Kate Pearson

My name is Kate Pearson and I am a Postgraduate student of Psychology working with Dr Edward Watkins within the Mood Disorder Centre, Exeter University and with Dr Eugene Mullan, North Devon Primary Care Psychological Treatment Service. My PhD research is jointly funded by the NHS and the Economic and Social Research Council, with the aim of increasing our understanding of the difficulties that people with depression experience in social situations and maintaining close personal relationships. Previous research suggests that depression is associated with a range of social difficulties, for example feeling uncomfortable talking in group situations. Social functioning problems can have serious long term consequences regarding happiness, quality of life and the recurrence of depression.

Research has shown that depression is frequently associated with a ruminative thinking style. Rumination describes a tendency to repetitively dwell on negative thoughts. I am interested in investigating whether the way that depressed people think about things affects social functioning. The research will compare information provided by people who are currently depressed, those who have a history of depression and those without a history of depression, to investigate how thinking style is associated with social functioning problems in depression. Thank you for taking the time to read this information.

Before you decide whether or not you would like to take part, please read this information sheet carefully. If you have any questions after reading this, please contact me directly, Tel: 01392 269271 or e-mail kap204@exeter.ac.uk.

Summary of the Study

The study will compare the relationship between different aspects of social functioning and thinking style in people who are currently depressed, have a history of depression or who have never been depressed. Participants will be interviewed and then asked to complete seven questionnaires, which ask about thinking style, social functioning and interpersonal style. Six months following the initial meeting, participants will be asked to complete six of the questionnaires again. In this way, I can look at how at how depression, thinking style and social functioning change over time.

Purpose of the Study

The research aims to increase understanding about why people with depression experience problems in their daily interactions with other people, at home and at work. Increasing understanding in this area could lead to the future development of new types of psychological therapy for overcoming difficulties associated with depression.

Why have I been chosen?

You have been identified as a potential participant through either, a) The Mood Disorder Centre database, b) The North Devon Primary Care Psychological Treatment Service, c) self-referral in response to an advertisement.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide that you want to participate you will be given this information sheet to keep, and be asked to sign a consent form. You are still free to withdraw from the study at any time, without giving a reason. A decision not to take part, at any time in the study, will in no way affect the standard of care you receive.

What happens if I agree to take part?**Stage 1: Finding out about you: Are you depressed now, do you have a history of depression or have you never been depressed?**

If you agree to take part in the research the first step is for me to find out a bit more about you. I will arrange to meet with you either at the Mood Disorders Centre or the North Devon Primary Care Psychological Treatment Service. The first session will take approximately **2.5 hours**. I will ask you about your current and past mental health, as well as your life more generally. I will also ask you a number of questions about how you have been in the past week, your work, your leisure time and your family life. The interview will take about two hours and, with your permission, be video-recorded. I am also interested in studying patterns of behaviour between people. A sample of recordings will be checked to ensure that the interview is completed correctly. The tapes will be stored in a locked filing cabinet in the Mood Disorders Centre and will only be accessible to myself and Dr. Watkins. The tapes will be stored securely and then destroyed, after a standard period of seven years.

Following a break, you will then be asked to complete seven questionnaires. The questions will ask about how sad and down you feel, how you respond to your feelings, how you relate to other people, your work, your spare time and your family life. You will also be asked to look at some pictures of faces and rate the emotions they are showing. This stage will take about thirty–five minutes.

Stage 2: 6 month follow up: Interview and questionnaires

There will be a follow up meeting approximately six months following the first meeting. This session will take about **1.75 hours**. As before, you will be asked some questions about your social functioning in the previous month and then asked to repeat the measures of social functioning and depression. Finally, you will be asked some questions about stressful events in your life.

Stage 3: Debriefing, follow up and access to research

All participants will be debriefed at the end of each study session. For those who want it, I will provide brief individual feedback summarising the main themes emerging from the

questionnaires and interviews, and answering any questions you may have. If any problems or concerns have been identified, these will be discussed with you and, with your consent, a follow up with your GP or other relevant clinician might be agreed. I will answer any questions and address any concerns that may have arisen. If you wish, you will be given a copy of the final research findings when they have been prepared.

Expenses

You will be fully reimbursed for all your travel costs.

What are the possible advantages, disadvantages and risks of taking part?

By taking part in the study you are supporting research which could inform the development of new forms of psychological therapy. The research may also help you to gain greater understanding of your own patterns of interacting with other people. For participants recruited through the Mood Disorder Centre and North Devon Primary Care Psychological Treatment Service, I am working in liaison with clinicians based in these services, and with your permission, will provide useful information to those clinicians responsible for your care.

Being part of this research will involve you giving a considerable amount of your time to complete the questionnaires. Some of the questions are personal in nature, and may involve talking about emotional issues. I will explore these issues with you in a sensitive and supportive way. Furthermore, you don't have to answer anything you don't want to, and you are free to withdraw from the study at any time if you don't wish to continue.

These interviews and questionnaires are frequently and commonly used in both research studies and in clinical practice with no evidence that they cause or increase difficulties, problems or distress. Rather, the evidence is that many participants find it useful, interesting and helpful to complete the interviews and questionnaires.

If at any time during the course of the research, you have any concerns or difficulties, support and advice is available directly from myself and from Dr Watkins and Dr Mullan, who are experienced senior clinical psychologists. If during the course of the research, any difficulties are identified, with your consent, I will liaise with your GP, to ensure that these issues are followed up and handled appropriately.

What if something goes wrong?

If you wish to complain or have any concerns about the way that you have been approached or treated during the course of this study, the normal National Health Service complaints mechanism is available to you (Patient Advice & Liaison Service FREEPHONE 0800 073 0741 or 01392 403621). If you wish to complain about any aspect of researcher's work you should contact Dr. Ed Watkins.

Will my taking part in this study be confidential?

All information collected about you during the course of the research will normally be kept strictly confidential. Any information about you will have your name and address removed so that you cannot be recognised from it. The main exception would be if the interview revealed a significant risk of harm to yourself or others, in which case information can be fed back to your GP and relevant clinicians but normally only after discussion with you. For those referred from the North Devon Primary Care Psychological Treatment Service, you will be given the opportunity to indicate whether you want the information you provide to be shared with the clinicians involved in your care.

What will happen to the results of the research study?

It is my aim to use the results for my PhD thesis and to publish relevant aspects in an academic journal. Your identity will not be revealed in any report or publication. The findings might also be reported on the Mood Disorders Centre website at: <http://www.centres.ex.ac.uk/>. The results of the research study will also inform the planning and development of clinical services within the North Devon Primary Care Psychological Treatment Service.

Who is organising and funding the research? Who has reviewed the study?

This research is funded by the Economic Social Research Council (ESRC) and the National Health Service, sponsored by the University of Exeter. The research has been approved by Devon and Torbay Local Research Ethics Committee and as such has the support of the University of Exeter, School of Psychology Ethics Committee. If you would like any independent advice about participating in research you can visit Consumers for Ethics in Research (CERES), an organization that offers information and advice on research in the NHS. CERES PO Box 1365 London N16 0BW E-mail: info@ceres.org.uk Visit: <http://www.ceres.org.uk/about.htm>

Contact for Further Information

If at any time, you have any questions or require any further support, guidance or advice, please feel free to contact me, Dr Watkins or Dr Mullan.

Contact Details

Dr. Edward Watkins
University of Exeter Mood Disorder Centre
School of Psychology
Washington Singer Laboratories
Tel: 01392 264692
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Dr. Eugene Mullan (Clinical Supervisor)
University of Exeter Mood Disorder Centre
School of Psychology
Washington Singer Laboratories
Tel: 01271 322442
E-mail: e.g.mullan@exeter.ac.uk

Further contact information for help and information:

For an excellent UK-based charity offering information, self-help groups and support groups contact Depression Alliance: telephone 0845 123 23 20
Depression Alliance, 212 Spitfire Studios, 63 - 71 Collier Street, London N1 9BE
Email: information@depressionalliance.org

For useful information about depression and for very helpful summary of useful self-help approaches to depression, we recommend the pamphlet, 'Help is at Hand' from the Royal College of Psychiatrists website:
<http://www.rcpsych.ac.uk/mentalhealthinformation/mentalhealthproblems/depression.aspx>

For places to go for help and support at any time or help with suicidal thoughts and feelings you can contact The Samaritans - Phone 08457 909090

The following books have proven helpful to many people with depression:
Greenberger, D. & Padesky, C. A. (1995). Mind over mood: Change how you feel by changing the way you think. New York : Guilford.
McDonnell, F. (2003). Threads of hope: Learning to live with depression. A collection of writing. London : Short Books.

Participant Consent Form

Research Title

The social context of depression

Principal Investigator Kate Pearson

Version/Date

Issue 2: 12th February 2007

REC Ref

Patient ID Number

		Please initial box
1	I confirm that I have read and understand the information sheet, dated 12th February 2007 , for the above study and have had the opportunity to ask questions.	
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.	
3	I understand that sections of any of my medical notes may be looked at by responsible individuals from the University of Exeter or from regulatory authorities where it is relevant to my taking part in research. I give permission for these individuals to have access to my records.	
4	I agree to my interviews being audio / video-taped for research purposes.	
5	I agree to my interviews to be audio / video-taped for teaching purposes.	
6	I agree to take part in the above study.	
7	I would like to be sent information about the results of the research when they are available.	
8	I would like to receive individual feedback from the study.	
10	I agree to my contact details being added to the Mood Disorder Centre database, so that I might be invited in the future to take part in the depression research.	
11	I have a partner or family member who is willing to participate and agree that they can be contacted and asked to complete a questionnaire.	
12	I give permission for my GP or other healthcare professional involved in my care to be contacted about my current level of depression if necessary.	
13	Applicable to referrals from the North Devon Primary Care Psychological Treatment Service only: I agree that the clinician(s) involved in my care within the North Devon Primary Care Psychological Treatment Service can have access to the information I provide.	

Name of Patient	Date	Signature
Name of Person taking consent (If different from researcher)	Date	Signature
Researcher	Date	Signature

