Gender Differences in Problem Discussion; The Depressive Effect of Co-rumination in Same-Sex Friendships.

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Abstract

The main objective of this thesis was to examine gender differences in co-rumination using observational, experimental, and diary methods. At the start of this project there were no existing studies which had assessed co-rumination in this way and this thesis intended to be an exploratory investigation of co-rumination using these methods. Rose (2002) defined co-rumination as 'excessively discussing problems within a dyadic relationship' (p. 1830) and used it to explain why females have closer, more supportive, friendships (Rose & Rudolph, 2006) but are also more susceptible to depression (Weissman & Klerman, 1977). Her findings suggest that co-rumination has maladaptive outcomes for females (increased depression and anxiety) but not for males. The six studies within this thesis aimed to investigate the outcomes of co-rumination using adult (Studies 1- 4), adolescent (Studies 5 and 6) and child samples (Study 6). The first three studies within this thesis assessed co-rumination using dyadic analyses of observational and experimental data. The results of these studies indicated that scores from the co-rumination questionnaire (CRQ) and the co-rumination coding scheme (CRCS) were associated with affect, but that the co-rumination manipulation used in Study 3 had no effect on levels of affect. CRCS was mainly predictive of depressive outcomes whereas CRQ was predictive of both depressive and anxious outcomes. The research indicated that CRQ scores positively correlated across the two dyad members. However, each dyad member's score showed different associations with affect, depending on whether the dyad member was presenting his or her own problem for discussion. The diary studies indicated that co-rumination was best assessed using daily items which were more predictive of changes in positive and negative affect than the CRQ. It was clear from the studies within this thesis that co-rumination did not only have negative outcomes for females, and that future research should examine the outcomes of co-ruminative discussions for males and females. It was suggested that future researchers should conduct similar experimental research to Study 3 but that they should include multiple co-ruminative interactions and more immediate assessments of co-rumination in the days following a co-ruminative interaction.

Detailed Abstract

This thesis investigates co-rumination using observational, experimental, and diary methods. Six studies are presented which investigate co-rumination using samples of adults, adolescents, and children (ages 11-30). The first three studies were observational and experimental and examined dyadic interactions in adult same-sex friendships, whereas the subsequent three studies used diary methods to investigate co-rumination in samples of adults, adolescents, and children.

The existing literature into co-rumination has largely utilised questionnaire-based methods and when research commenced on this thesis there were few studies that used other methods. Rose (2002) defined co-rumination as 'excessively discussing problems within a dyadic relationship' (p. 1830) and used this concept to explain why females have closer, more supportive, friendships than males (Rose & Rudolph, 2006) but are also more susceptible to depression (Weissman & Klerman, 1977). Rose (2002; Rose, Carlson, & Waller, 2007) suggested that seemingly healthy friendships could have both adaptive and maladaptive outcomes for females and her research supported this; co-rumination led to increased levels of depression and anxiety for adolescent girls and increased closeness for boys and girls. Rose suggested that the paradoxical effects of females reporting closer friendships, which should buffer against emotional distress, but also reporting higher levels of depression, could be explained by co-rumination.

Study 1 investigated the affective outcomes of co-rumination using same-sex pairs of male or female friends. Participants were asked to have two problem discussions in the lab and used video-cued recall to rate their own, and their friend's, happiness and calmness at 15 time-points during the replayed conversation. The video recordings

from each conversation were also coded using the Co-rumination Coding Scheme (CRCS; Rose, Schwartz, & Carlson, 2005). The results indicated that participants felt less happy and less calm during discussion of their own problems than they rated their friends as being. Observed co-rumination (CRCS) was a reliable negative predictor of overall happiness across males and females, whereas scores on the Co-rumination Questionnaire (CRQ; Rose, 2002) had very little effect on happiness or calmness.

Study 2 again used an adult sample to investigate co-rumination in same-sex friendships. In order to assess possible causal effects, an additional manipulation was included that was intended to target co-rumination. Twenty pairs of male friends and twenty pairs of female friends were asked to discuss a problem for five minutes. The intended co-rumination condition involved covertly asking the participant who was not presenting their problem for discussion to repeatedly encourage his or her friend to stay focused on discussing the problem. The control condition involved no such instruction. Positive and negative affect (PA and NA; from the Positive and Negative Affect Scale; PANAS; Watson, Clark, & Tellegen, 1988) were assessed at 5 time-points (24 hours before the conversation, immediately before the conversation, immediately after the conversation, two weeks after the conversation, and six months after the conversation), and results indicated that there were effects of CRQ and CRCS but that the experimental manipulation had no effect. At the two-week follow-up females reported significantly higher PA and NA, whereas males only reported increased NA. By the six-month follow-up, men were reporting significantly higher NA scores than women but their PA scores had increased to match the females' scores. CRQ moderated the effects of time and gender on negative affect while CRCS moderated the effects of time and gender on positive affect. The major weakness of the study was the fact that the co-rumination manipulation had no measurable impact

on reported co-rumination in the experimental condition and this was addressed in Study 3.

Study 3 employed a larger adult sample than Studies 1 or 2 and also attempted to manipulate co-rumination using a different method. As with Study 2, participants had one 5-minute problem discussion, but were assigned to one of three conditions: negative (asked to focus exclusively on the negative aspects of the problem); solution-focused (focusing only on solving the problem); or a control condition (no experimenter intervention). Affect was assessed (PANAS; Beck Anxiety Inventory, BAI, Beck, Epstein, Brown, & Steer, 1988; and Beck Depression Inventory, BDI-II, Beck, Steer, Ball, & Ranieri, 1996) at 4 time-points (one week before the problem discussion, immediately before the problem discussion, immediately after the problem discussion, and two weeks after the problem discussion). The manipulation had the desired effect and participants co-ruminated more in the negative condition than the control or solution-focused conditions. The results indicated that condition did not have an effect on affect following the experimental interaction, and that participants experienced significant decreases in PA and increases in NA two weeks after the problem discussion, regardless of their experimental condition. There were significant gender differences in the effects of the co-rumination measures; The CRCS had more of an effect on females and the CRQ scores had more of an effect on males. The main direction for future research from Study 3 and the previous two observational studies was that researchers should focus on investigating co-rumination across multiple interactions rather than just focusing on one co-ruminative discussion.

Study 4 investigated co-rumination in adults using the diary method. The study was the first piece of research of its kind and was largely exploratory. The 10-day study involved participants completing daily ratings of positive and negative emotion and

completing the CRQ (at the end of the study). The results provided no evidence of significant gender differences in affect, but CRQ was a significant positive predictor of general negative emotion (not problem-specific emotion) regardless of whether the day was a problem-discussion day or not. The study was limited by the large amount of missing data and it was suggested that attrition could be reduced by asking participants to submit their diary in-person every day, rather than completing it online. In this way the researchers could prompt the participants to complete the questionnaires and to double-check their answers.

Study 5 used a similar methodology to Study 6 but the participants submitted their diaries daily for 11 days and the PANAS was used to assess changes in affect, rather than the positive and negative emotion variables which were created for Study 4. The study employed an exclusively female adolescent sample of 16-18 year olds. Due to missing data the results from the study focused on reports from the highest and lowest problem day for each participant. The results showed that NA was significantly higher on high-problem days compared with low-problem days and CRQ was found to be a positive predictor of NA on non-problem days. As Study 5, similarly to Study 4, was challenged by missing data, it was suggested that in Study 6 (conducted in a school) participants should complete their diary in the presence of the researcher (during a three-hour study period) and submit it at the end of the session.

Study 6 investigated co-rumination in an all-female sample of schoolchildren and adolescents aged 11-16. Participants reported daily changes in affect along with two assessments of how much they had been co-ruminative in their problem discussions that day (in addition to the CRQ at the end of the study). The results indicated that although participants experienced higher levels of NA on problem days than non-problem days, this was not related to their CRQ scores. However the two daily

measures of co-rumination that were used did show some association with PA and NA. It was suggested that future researchers should conduct a similar study, which included daily assessments of co-rumination, using a male sample, so that gender differences in the emotional outcomes of co-rumination reported on a daily basis could be assessed.

Overall, I concluded that co-rumination did not exclusively have effects for females and that the emotional outcomes of co-rumination for males should also be considered. The CRCS and the CRQ had differing effects on depression and anxiety across the observational and experimental research; CRCS was more predictive of depressive symptoms (especially for females) and the CRQ score had effects on both depression and anxiety for males and females. The research from this thesis suggests that future researchers should focus on ways of ethically manipulating co-rumination in adolescent samples, and that co-rumination should be assessed over several interactions, using more immediate and frequent follow-ups than in the current research. In addition, the diary research indicated that the two daily-measures of co-rumination were more predictive of changes in affect than the CRQ, and it was suggested that future researchers should focus on conducting similar research with a male sample.

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1 INTRODUCTION

We are defined by not only our personal achievements but also our interpersonal interactions; our friends, in particular, shape who we are and how we behave. There is a well-established tradition of friendship research in Psychology and researchers are closer than ever to understanding the complexities of human relationships. However, the majority of the research has focused on the individual's attitudes and behaviours rather than on the nature of the relationship between two people. This thesis aims to examine the nature of the relationship itself, and how our relationship styles can predict both positive and negative outcomes for individuals' health and wellbeing. The research in this thesis focuses on a particular type of problem discussion: 'co-rumination' (Rose, 2002). Co-rumination is a relationship style where two people discuss their problems in a negative, non-solution focused, repetitive manner. Previous research has suggested that, in some instances, co-rumination can lead to negative health outcomes for females but not for males (Rose, 2002; Rose et al., 2007). This thesis aims to build on the past research by investigating this topic, which has largely been dominated by questionnaire-based methods, using observational, experimental, and diary methods. The previous research and the aims of this thesis are presented in this chapter: Firstly, the previous research into gender differences in friendships, problem discussion, and self-disclosure is discussed, followed secondly by an examination of the rumination and co-rumination literature. Finally,

methodological concerns about the previous research and the aims of this thesis will be addressed.

1.1 Gender Differences

It is clear that males and females can differ in their approaches to how they interact with those around them. These differences are underpinned not only by our biology but also by societal norms, which suggest differing appropriate behaviours for men and women. It is clear that these differences may be a result of our evolutionary heritage and the differing demands that evolution has placed on men and women to reproduce and survive. Traditionally males are focused on providing resources, whereas the role for women is more concentrated on nurturing and child rearing. Through natural and sexual selection these differences have been magnified and have resulted in differing behavioural patterns for men and women; in stressful situations men are more likely to show a fight-or-flight response (Cannon, 1932) whereas women are more likely to tend-and-befriend (Taylor, Klein, Lewis, Grunewald, Gurung & Updegraff, 2000). This greater focus on emotion for females is characteristic of their modern-day interactions with each other and could be a contributing factor to the higher rates of depression and anxiety experienced by females (Hankin & Abramson, 2001; Nolen-Hoeksema, 2002). Whereas the more solution-focused approach adopted by males may protect them to a greater extent from these negative health outcomes (Billings & Moos, 1981). This thesis will examine why, despite women being more nurturing and having closer friendships than their male peers (Bukowski, Hoza, & Boivin, 1994), which have been shown to be predictive of stress reduction (Turner, 1994), they report higher levels of depression and anxiety (Hankin & Abramson, 2001).

1.1.1 Gender Differences in Problem Discussion, Friendships, and Self-disclosure

Friendship research has traditionally focused on either positive outcomes of well-functioning relationships (e.g., increased closeness), or negative repercussions of friendship breakdown (e.g., conflict and victimisation; Rose & Rudolph, 2006; Rudolph, 2002). Only a relatively small area of the literature examines the negative emotional effects that seemingly supportive close friendships can have (e.g., Curci & Rimé, 2012, Rose, 2002; Rose et al., 2007). Close friendships should act as a buffer against emotional distress (e.g., Brendgen, Vitaro, Bukowski, Dionne, Tremblay, & Boivin, 2013; Turner, 1994). However, despite generally having closer friendships than their male peers (e.g., Bukowski, Hoza, & Boivin, 1994), female adolescents report more stress than males (e.g., Rudolph, 2002). They also have higher rates of anxiety, depression, and low self-esteem (e.g., Hankin & Abramson, 2001; Nolen-Hoeksema, 2002). This thesis aims to investigate why female friendships have these apparently paradoxical effects, and to explore the reasons for gender differences in the emotional impact of close friendships.

1.1.1.1 Gender Differences in Friendships

The research into gender differences in friendships is vast, and it is clear that there are significant differences between the ways that males and females behave with their close friends (for a comprehensive review, see Rose & Rudolph, 2006). Research into friendships in childhood and adolescence shows that girls spend a significantly longer time interacting with each other in dyads than boys do (Martin & Fabes, 2001), and have longer conversations within these dyads (Ladd, 1983). Girls also value social goals and adopt relationship-maintaining goals more than boys do (Ford, 1982; Rose

& Asher, 1999). However, girls also report higher levels of stress than boys do in adolescence, particularly higher levels of friendship-related stress, such as relationship breakdown or disruption within a friendship (Rudolph, 2002). These differences in dyadic interactions may contribute to differing levels of emotional adjustment for males and females, especially in the teenage years. Previous research generally suggests that girls receive more positive outcomes from friendships than boys do; including feelings of closeness (Bukowski et al., 1994; Rose, 2002; Rose et al., 2007), trust (Sharabany, Gershoni & Hofman, 1981), validation (Parker & Asher, 1993), and affection (Lempers & Clark-Lempers, 1993). Although these positive outcomes should buffer against emotional distress it is clear that females report higher levels of anxiety and depression in adolescence than males do (e.g., Hankin & Abramson, 2001; Nolen-Hoeksema, 2002) and further research needs to be conducted to examine why these paradoxical effects occur.

In addition to the vast amount of research on the positive outcomes of friendships, there is also a large body of work that examines negative elements such as relationship breakdown, jealousy, gossiping, and the emotional outcomes of unhealthy relationships (e.g., Parker & Asher, 1993; Parker, Low, Walker & Gamm, 2005). Research into social support has also suggested that there can be negative effects of seemingly healthy and supportive mutual friendships which are often a by-product of well-meaning interactions. For example, Bolger and Amarel (2007) found that invisible support, which the recipient was unaware of, was more effective in alleviating symptoms of distress than visible support. Further, they found that visible support, which the recipient was aware of, in some instances exacerbated reactivity. Rose (2002) has also suggested that there are negative outcomes for these seemingly supportive friendships, and that these outcomes are an unintentional by-product of

discussing problems in a certain way. If discussing problems within close friendships can lead to negative outcomes, especially for females, this might help to explain why there is a discrepancy between the friendship literature and the mental health literature; adolescent females, despite generally having closer friendships than their male peers, which should act as a buffer against emotional distress, report higher levels of depression and anxiety.

1.1.1.2 Gender Differences in Self-disclosure and Problem Discussion

Gender differences in self-disclosure have also been well researched. Research conducted on children and adults suggests that self-disclosure is related to positive friendship adjustment (Calmes & Roberts, 2007; Rose, 2002) and disclosing one's personal thoughts and feelings to another leads to greater friendship satisfaction (Jones, 1991). Females self-disclose more than males (e.g., Calmes & Roberts, 2007) and also care more about having dyadic friendships (Benenson & Benarroch, 1998) and closeness than males (Henrich, Blatt, Kuperminc, Zohar, & Leadbeater, 2001). Thus, the research suggests that not only do females self-disclose more than males do, but also that self-disclosure should lead to greater positive outcomes for females than males. The findings from friendship research have largely supported this, whereas the finding that adolescent girls suffer from higher rates of depression and anxiety than boys do contradicts it. It could be due to the repetitive and ongoing nature of the problem discussion (Curci & Rimé, 2012) or it could be the case that different types of self-disclosure have both positive and negative outcomes. Problem discussion, as one form of self-disclosure in particular, has produced interesting results that require further research (Rose, 2002).

Only a few friendship researchers have examined gender differences in problem discussion in particular, rather than self-disclosure in general. Rose, Swenson, and Robert (2009) investigated the reasons for girls' higher rates of self-disclosure in childhood and adolescence (i.e., between the ages of 9 and 17; Rose, 2002). The researchers suggested that previous friendship research had focused selectively on the positive aspects of girls' friendships without considering the positive aspects of boys' friendships. Their research therefore focused on boys' and girls' motivations for refraining from prompting friends to talk about problems. They found that boys are significantly less likely to prompt their friends to talk about problems than girls are. Contrary to predictions, girls refrained from talking about problems for more pro-social (and less selfish) reasons than boys. For girls, pro-social motives (e.g., not wanting to upset or embarrass the other person) were a greater predictor of not prompting talk about problems than selfish ones (e.g., it is not fun to talk about the friend's problem), whereas for boys both pro-social and selfish reasons were equally predictive. Therefore, it could be the case that boys are less concerned with discussing their friends' problems (for both prosocial and selfish reasons), and do not see the lack of discussing them as a negative factor in their friendship. A further explanation might be that boys are more intent on protecting their own emotional wellbeing and therefore do not want to discuss their friends' problems with them. Rose et al.'s (2009) research examines why children and adolescents do not want to discuss their friends' problems with them, and more recent research has further examined how boys and girls expect self-disclosure about problems will make them feel (Rose, Schwartz-Mette, Smith, Asher, Swenson, Carlson et al., 2012).

Rose et al.'s (2012) focus on perceived emotional outcomes provides a new and interesting direction for self-disclosure research. It is important to gain insight not

only into the frequency of male and female self-disclosure, and what prevents both sexes from discussing their friends' problems, but also into what motivates them to self-disclose, and what they expect from it. The researchers investigated expectations of self-disclosure across four studies with children and adolescents (aged 8-17). In all four studies, girls reported significantly more positive motives for self-disclosure than boys. Girls reported that they expected self-disclosure would make them feel cared for and understood, and would give them a sense of relief, as if their feelings were no longer bottled up (Rose et al., 2012). There were fewer gender differences in negative expectations (e.g., being embarrassed, being made fun of, or the other person thinking badly of them). However, boys were more likely than girls to report that they expected self-disclosure would make them feel weird or like they were wasting their time.

These findings give a good indication of why girls might self-disclose more than boys do, as it would seem that girls believe that self-disclosure will have more positive outcomes for them than boys do. In addition, boys are more likely to expect at least some negative outcomes from self-disclosure. This, of course, may be because their predictions are accurate and are a result of learning from previous experiences of self-disclosure. However, further investigation is needed to determine if predicted outcomes for individuals match with the reality of their problem discussion. It seems necessary to take into account differences in males' and females' perceptions of how self-disclosure will affect them in addition to differences in how self-disclosure affects them in reality, in order to gain a more comprehensive view of the process.

Curci and Rimé (2012) have suggested that problem discussion within close, normally functioning friendships can lead to maladaptive outcomes. Their research, using a

sample of adult pregnant women, found that prolonged social sharing had a negative impact on emotional recovery. The continual discussion of the problem meant that the emotional salience of the problem did not extinguish in the normal manner. Although the researchers acknowledge that a sample of pregnant women may be experiencing heightened emotions, there is no reason that the result should not translate to other female samples, or even male samples. This research, along with the research into co-rumination which is presented later in this chapter, suggests that there are maladaptive outcomes to close friendships which will be examined further in this thesis.

1.2 Rumination and Gender Differences in Depression

From mid-adolescence onwards, females are reported to have higher rates of depression than males (Hankin, Wetter, & Cheely, 2008; Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Pigott, 1999; Weissman & Klerman, 1977) and, as has been previously suggested, the friendship literature offers very little explanation for this finding amongst adolescents with healthy, normally functioning friendships. The peak in depression for girls in adolescence is especially interesting because it occurs at the time when, particularly for females, social interactions are becoming more prominent and important to them. Research indicates that adolescent girls are more concerned about their social interactions than boys are; they are more likely to report relationship-maintaining goals (Rose & Asher, 1999), desire closeness, worry about hurting others, worry about relationship breakdown (Henrich, Blatt, Kuperminc, Zohar & Leadbeater, 2001; Kuperminc, Blatt & Leadbeater, 1997), worry about peer evaluation (LaGreca & Stone, 1993), show greater jealousy about friends' other peer relationships (Parker et al., 2005), value social goals (Ford, 1982), and display support-seeking behaviour (Hunter & Boyle, 2004). Predominantly the research

indicates that females have more positive outcomes from these friendships than males do (for a review, see Rose & Rudolph, 2006). However, it is clear that increased depression is also an outcome of these increased social interactions for females.

Another factor, which may contribute to adolescent females' higher rates of depression, is rumination (Nolen-Hoeksema, 1987). Nolen-Hoeksema describes rumination as thinking 'repetitively and passively about their negative emotions, focussing on their symptoms of distress, and worrying about the meanings of their distress' (p. 504, Nolen-Hoeksema, 2000). It is a maladaptive response to stress where the individual focuses on their negative emotions rather than the causes of them and this interferes with their ability to problem-solve (Lyubomirsky & Nolen-Hoeksema, 1995). Rumination has been found to be a significant correlate of depression and, as females have been shown to ruminate more often than males do (Nolen-Hoeksema & Morrow, 1993), this might be considered a contributing factor to the gender difference in depression. Longitudinal research has demonstrated that rumination predicts depressive symptoms over time, even when controlling for baseline depressive symptoms (Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema & Morrow, 1991), suggesting that rumination plays a key factor in the development of depressive symptoms. Further, women are more likely than men to focus on their mood when they are experiencing depressive symptoms (Butler & Nolen-Hoeksema, 1994), and females (both girls and women) are more likely than males to use rumination as a response to distress (Nolen-Hoeksema et al., 1999). Most importantly, rumination has been shown to predict the onset and maintenance of depression in adolescents (Abela & Hankin, 2011; McLaughlin & Nolen-Hoeksema, 2012; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007) and adults (Nolen-Hoeksema, 2000).

Therefore, it is clear that rumination plays a key role in explaining why females suffer from higher rates of depression than males.

However, rumination, unlike co-rumination, is not a social process, and the rumination literature cannot explain why females with seemingly supportive friendships, which should buffer against emotional distress, still report higher levels of depression and anxiety. Rose (2002) suggested that rumination could be used as a starting point for investigating these high levels of depression and anxiety. She suggested that it might be a social manifestation of rumination (so-called *co-rumination*; Rose, 2002), which can explain the discrepancy between the time spent in supportive friendship dyads and the negative emotional outcomes for adolescent females. This is supported by MacLaughlin and Nolen-Hoeksema (2012) who suggest that it could be because individuals who ruminate are more likely to seek social support from others (Nolen-Hoeksema & Davies, 1999) and that this support seeking may take the form of co-rumination.

1.3 Co-rumination in Same-Sex Friendships

'Co-rumination' has been offered as an explanation for the seemingly paradoxical effects of females having closer, more supportive, friendships but also being more susceptible to depression. Rose (2002) defined co-rumination as 'excessively discussing problems within a dyadic relationship' (p. 1830) and suggested that co-ruminative friendships can be both adaptive and maladaptive. Co-rumination is a single construct that integrates the adaptive concept of self-disclosure with the maladaptive concept of rumination.

Co-rumination is examined using the 27-item self-report Co-rumination Questionnaire (CRQ; Rose, 2002; See Appendix 1), which assesses an individual's tendency to co-ruminate with their close same-sex friends. The measure asks the individual to report on their co-ruminative style within their close same-sex friendships. The questions require the individual to report on the relationship style rather than their individual tendency to co-ruminate, e.g., 'We spend most of our time together talking about problems that my friend or I have'. What separates co-rumination from more general problem discussion is that it is non-solution-focused and emphasises the negative aspects of the conversation.

Rose's (2002) initial research recruited 608 children and adolescents in Midwestern American school districts to complete the self-report CRQ. Participants also completed measures of self-disclosure, self-reported friendship quality and closeness (all taken from a revised version of the Friendship Quality Questionnaire; Parker & Asher, 1993), rumination (Intimate Exchange subscale of the Responses to Depression Questionnaire; Nolen-Hoeksema & Morrow, 1991), and internalising symptoms (Children's Depression Inventory; Kovacs, 1992; Children's Manifest Anxiety Scale; Reynolds & Richmond, 1978). The results indicated that girls reported significantly higher levels of co-rumination than boys (both children and adolescents), and adolescent girls reported co-ruminating more than female children. Boys' co-rumination scores did not significantly differ between children and adolescents (Rose, 2002). Therefore, the higher levels of co-rumination in adolescent girls may provide an explanation for the peak in depression (Weissman & Klerman, 1977). Girls also scored significantly higher than boys on their ratings of self-disclosure, rumination, friendship quality, and internalising symptoms (depression and anxiety).

Rose (2002) further investigated whether participants' tendency to co-ruminate correlated with any of the other measures and interestingly she found that co-rumination positively correlated with both self-reported friendship quality and internalising symptoms (depression and anxiety). Linear regressions revealed that the relationship between co-rumination and friendship quality was reduced when controlling for self-disclosure, and the relationship between co-rumination and internalising symptoms was reduced when controlling for rumination. However, the single construct of co-rumination remains important because when co-rumination and self-disclosure were included as simultaneous predictors of internalising symptoms, only co-rumination predicted internalising symptoms. In addition, when co-rumination and rumination were included as simultaneous predictors of friendship quality, only co-rumination predicted friendship quality. This suggests that co-rumination may help to explain why seemingly healthy friendships can be both adaptive and maladaptive. Further, it can suggest an explanation for why depression rates are higher amongst teenage girls but that this age group also report high levels of positive friendship quality. The findings support Rose's (2002) theory that co-rumination is a negative form of self-disclosure combined with a more social form of rumination.

Rose's (2002) research was cross-sectional and only examined data from a single time-point. As a result the researchers were unable to ascertain if co-rumination was an antecedent or concomitant of adolescent depression. A subsequent large-scale (N = 999) longitudinal study, which used the same measures, extended the previous research and examined co-rumination at two time-points, six months apart (Rose et al., 2007). The research showed that co-rumination measured at the start of the study positively predicted depression, anxiety, and positive friendship quality for female

participants (aged 8-15) at the 6-month follow-up (Rose et al., 2007). In contrast, for male participants, co-rumination only predicted positive friendship quality, and had no effect on depression or anxiety. Taking into account the close link between depression and co-rumination these findings could be used as an explanation for the higher rates of depression for females in adolescence, although the sample covered a broader age range, which included both adolescence and childhood. It would appear that close friendships only offer support for males but could lead to detrimental emotional outcomes for females.

The finding that co-rumination positively predicted depression, anxiety, and friendship quality for female participants after six-months is particularly worrying because the researchers also found that initial depression, anxiety, and friendship quality positively predicted co-rumination at the six-month follow-up (for both males and females; Rose et al., 2007). This suggests that females may get trapped in a spiral of continually increasing levels of co-rumination, rumination, and friendship quality over time. Even though the effect sizes found in Rose et al.'s (2007) study were small, these could have been magnified (or reduced) over a longer period of time. The scope of the study was limited because there was only one six-month follow-up and the relationship may have become stronger (or weaker) over a longer period of time.

1.3.1 Co-rumination, Depression, and Anxiety, in Adolescence

Rose's two primary studies (Rose, 2002; Rose et al, 2007) suggest that there are maladaptive (increased depression and anxiety) outcomes of co-rumination for women. Further research into co-rumination has primarily adopted the same correlational approach as Rose and has mainly supported her findings. Starr and Davila (2009) found that co-rumination significantly positively correlated with

depression in a sample of 83 early adolescent girls. Similarly, Tompkins, Hockett, Abraibesh, and Witt (2011), in a sample of adolescents (age 14-19), found that being female predicted higher levels of co-rumination which in turn increased internalising symptoms. These two studies (Starr & Davila, 2009; Tompkins et al., 2011) support the fact that, for females, co-rumination is associated with higher levels of depressive symptoms.

The link between co-rumination and depression has also been supported by two further studies, but there were no gender differences found in their research. Stone, Uhrlass, and Gibb (2010) found that children (aged 9-14) currently exhibiting high levels of co-rumination (with their mothers) were more likely to have a history of depressive symptoms, even after controlling for current depressive symptoms. As Rose argues, this suggests that there may be a cyclical link between depression and co-rumination, i.e., that co-rumination leads to depressive symptoms but also that depressive symptoms lead to increased co-rumination. Similarly, Hankin, Stone, and Wright (2010) found in their sample of 350 students (aged 11-17), that greater co-rumination predicted elevated trajectories of depressive symptoms over time (4 months).

Therefore it is clear that there is a relationship between co-rumination and depressive symptoms. However, since the research has been largely self-report and correlational it is hard to determine causality. The only two observational studies (both using the same methodology), which examine the relationship between co-rumination and internalising symptoms (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010), only focus on anxiety. They found no relationship between co-rumination and anxiety using the standard Co-rumination Questionnaire (CRQ; Rose, 2002) but they did find

that co-rumination as coded by external raters (Rose et al., 2005) predicted anxiety in the problem discussion condition in one study (Byrd-Craven et al., 2007), and in the problem condition and the control condition in the other study (Byrd-Craven et al., 2010; see section 1.3.5. on Observational Studies for further details).

It is clear that experimental research which manipulates co-rumination is needed, firstly to examine whether co-rumination does have a depressive effect, but also, whether the gender differences which have been found in some studies (Rose, 2002; Rose et al., 2007; Starr & Davila, 2009; Tompkins et al., 2011) are supported by experimental research. This could not be determined by the observational research in the Byrd-Craven studies (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010) as they did not use an experimental manipulation of co-rumination and they used an exclusively female sample. These issues will be addressed in this thesis (Chapters 2, 3, and 4; further research on depressive outcomes of co-rumination in adult, rather than adolescent or child samples, is presented below).

1.3.2 Co-rumination and Relationship Quality

Although there has been much research on the depressive outcomes of co-rumination, there has been relatively little research on the positive outcomes of co-rumination since Rose's research (2002; Rose et al., 2007), which suggested that co-rumination has a positive effect on friendship quality. Of the studies subsequent to Rose's research that have included a measure of relationship quality in same-sex friendships (Smith & Rose, 2011; Starr & Davila, 2009), the results have largely indicated support for Rose's initial findings. Smith and Rose (2011) found, in their sample of 308 students (aged 11-14), that co-rumination mediated the relationship between social perspective taking and friendship quality, consistent with Rose's original ideas.

Similarly, Starr and Davila (2009) found that those adolescent girls (female only sample) who reported a more secure friendship also reported higher levels of co-rumination. Finally, Calmes and Roberts (2008) reported a significant positive relationship between co-rumination and friendship satisfaction in their undergraduate sample, however this only applied to females.

Although these three studies do not exactly replicate the initial measures used by Rose (2002; Rose et al., 2007), they all present evidence which supports a strong positive link between co-rumination and friendship quality. Furthermore, there are no studies suggesting that co-rumination leads to lower quality friendships. However, this may be due to the fact that most research uses a single time-point assessment, which does not allow the researchers to investigate how a co-ruminative relationship unfolds over time. The fact that relationship quality has been omitted from much of the co-rumination research means that Rose's (2002; Rose et al., 2007) initial findings require more investigation. These positive aspects of co-rumination may be maintaining the co-ruminative relationships and fuelling the individuals' self-disclosure. The research within this thesis will address whether Rose's findings can be supported and to what extent closeness within a relationship has an effect on levels of co-rumination and depressive outcomes.

1.3.3 Gender Differences in the Prevalence of Co-rumination

Rose's research (2002; Rose et al., 2007) found that females co-ruminate significantly more than males do; this has been supported by the majority of subsequent studies (Hankin et al., 2010; Jose et al., 2012; Tompkins et al., 2011). The only study that has failed to find a gender difference (Stone et al., 2010) had a relatively small sample (N= 81) compared to Rose's (N= 608, for Rose, 2002; N= 999, for Rose et al., 2007).

The absence of a gender difference in a sample this small is not surprising, especially in light of the small effect size for gender reported by Rose (2002). Therefore it would seem that there is strong support for the gender difference.

However, Rose (2002) suggests that the low prevalence of co-rumination amongst males in her research may have been a contributing factor to the gender difference in depressive outcomes (i.e., absence of the same maladaptive outcomes for males which was found for females), simply because not enough males in the sample were co-ruminating to find an effect. Therefore it will be important to investigate co-rumination experimentally to assess if co-rumination has the same maladaptive emotional outcomes for males as it does for females (when participants are encouraged to co-ruminate). The only observational studies where co-rumination was coded from the conversations (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010) used exclusively female samples so were unable to investigate these gender differences. The observational and experimental research within this thesis used mixed-gender samples (Chapters 2, 3, and 4) and therefore the shortcomings of the existing observational research will be addressed and gender differences will be examined.

1.3.4 Age Differences in Co-rumination

As the research for this thesis concerns co-rumination in children, adolescents, and adults, it is important to note the similarities and differences in relevant findings concerning these different populations. All participants used in the present research were above the age of 11, mainly because the high school system starts at 11 in the United Kingdom, whereas Rose's (2002; Rose et al., 2007) research included children as young as 8 because this is the age they start middle-school in the United States.

Further, young children's friendships show less self-disclosure and intimacy than their older counterparts (McDougall & Hymel, 2007), and the results of interest are found in adolescence in Rose's study, so it was deemed appropriate to include children from slightly before puberty (age 11) and older.

The research reported in this thesis used participants ranging in age from 11-30 years old. The entirety of the experimental research (Chapters 2, 3 and 4) was, for ethical reasons, conducted using adults rather than children (aged 18-30). Due to the fact that the research is exploratory, and may lead to negative emotional outcomes, it was deemed appropriate to only use an adult sample. Therefore there is no age comparison within these chapters but the findings are compared to previous research (using children, adolescents, and adults). However the diary studies within this thesis (Chapters 5, 6, and 7) included participants aged 11-23, and due to the similarity in methodologies across these studies, age differences will be discussed.

The original co-rumination research conducted by Rose and her colleagues (Rose, 2002; Rose et al., 2007) examined co-rumination in samples of children and adolescents. Subsequent research has continued to examine co-rumination predominantly within this age group and within undergraduate student samples (e.g., Byrd-Craven et al., 2007; Byrd-Craven et al., 2010; Calmes & Roberts, 2008; White & Shih, 2012). Relatively few studies have examined adult co-rumination. The participants in Calmes and Roberts' (2008) study were aged between 18 and 45 but the researchers did not report any analyses of the effects of age and given the fact that the mean age of their sample was around 19 we can assume that their sample did not include enough older adults to conduct such analyses. Haggard, Robert, and Rose's (2011) research into co-rumination is the only other study to examine co-rumination

in an adult sample with participants from a wide age range (27-78). However, despite the broad age range, and good distribution of participants across this age range, they did not present any analyses including age. Their research showed that the gender difference in co-rumination found by Rose and other researchers (i.e., women report co-ruminating significantly more than men), also existed in adulthood. Their mean scores on the co-rumination questionnaire were roughly comparable with those from the younger sample in Rose et al.'s (2007) study. In the adult sample, females' co-rumination scores (M = 2.90) were slightly higher on average than the adolescent sample (M = 2.85) and the child sample (M = 2.73) from the Rose study (Rose et al., 2007). Similarly, adult males (M = 2.39) scored somewhat higher than both adolescent males (M = 1.81) and children (M = 2.27). However, as Haggard and colleagues did not report the standard deviations of these scores it is difficult to directly compare the samples.

In all but one of the studies using undergraduate student samples, gender differences in co-rumination were not reported. The one study where gender differences were found (Calmes & Roberts, 2008) indicated that undergraduate females (M age = 19.7; M = 3.42) and males (M = 2.82) reported, on average, higher levels of co-rumination than other existing research (from samples of adults, adolescents, and children; Haggard et al., 2011; Rose et al., 2007). However it must be noted that the Calmes and Roberts (2008) study used a 16-item version of the co-rumination questionnaire rather than the original 27-item measure that is used in the other studies. These crude comparisons of mean scores reported in different studies broadly suggest that there may be heightened co-rumination in undergraduate samples (aged 18-21). These age differences will be discussed further in a subsequent chapter of this thesis (Chapter 6).

1.3.5 Observational Studies and Co-rumination Coding

The co-rumination coding scheme was developed by Rose et al. (2005) as a way of determining levels of co-rumination within a single interaction. The coding scheme has five areas of assessment which are all coded on a 5-point Likert scale (from 1, not at all, to 5, extremely): (1) mutual encouragement of problem talk; (2) rehashing problems; (3) speculating about problems; (4) dwelling on negative affect; (5) global co-rumination. The global co-rumination score (CRCS) is calculated by averaging the score of the first four items. Using the coding scheme, Rose and colleagues coded 16 minutes of problem conversations each from 48 participants aged between 14-15 years (Rose et al., 2005). Results suggested that the findings from the original research held true; girls co-ruminated more than boys and co-rumination led to higher levels of friendship quality and internalising symptoms. However, there were no findings presented with regard to the gender differences in internalising symptoms found in previous research (Rose, 2002). This lack of gender differences could be due to several factors; it could be a result of the small sample size in the observational study compared with the previous research (Rose, 2002) or it could be the case that the self-report measure (CRQ) and the observed co-rumination score (CRCS) measure different things. Of the three studies, which have included both co-rumination from the CRQ and as an observed score (CRCS), none of them have examined directly if there is a correlation between the measures (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010; Rose et al., 2005).

The two studies by Byrd-Craven et al. (2007; 2010; both using the same methodology), which included analyses of both CRQ and observed co-rumination (CRCS) scores, involved female undergraduate friendship dyads that were assigned to

a problem talk condition or a control condition (designing a recreation centre). Participants talked for 17 minutes and their Cortisol levels were taken (to measure their anxiety levels) before and after the discussions. Observed levels of co-rumination (coded using the CRCS developed by Rose et al., 2005) and in particular the measure of 'dwelling on negative affect' only predicted post-interaction Cortisol in the problem talk condition in the first study (Byrd-Craven et al., 2007). In contrast, in the second study, observed co-rumination predicted post-interaction Cortisol in both conditions equally (Byrd-Craven, 2010). This suggests that co-ruminative discussions may lead to increased anxiety. However the results of the second study suggest that it may not matter whether the problem is personal (problem talk condition) or general (recreation centre condition). However, these results were only found for the co-rumination coding and not for the scores on the standard co-rumination questionnaire measure (CRQ; Rose, 2002). This again, as with Rose et al.'s (2005) research, suggests that there might be a difference between coded co-rumination (CRCS) and self-reported co-rumination (CRQ); this is not too surprising given the fact that the self-report co-rumination measure incorporates co-rumination across several close friendships, unlike the coded measure which only examines co-rumination in one interaction with a particular person. It is clear that the examination of the differences between the two measures merits further investigation and the observational and experimental studies within this thesis will examine the relationship between observed and self-reported co-rumination scores (for further details on coded co-rumination see below; 1.4.4).

1.3.6 Diary Research

To fully investigate whether co-rumination does have depressive effects it is necessary to employ a diary design. The CRQ includes questions which examine participants' co-ruminative style within their problem discussions, but also more relationship-based variables (looking at their typical behaviour in their close relationships), such as the frequency of co-ruminative episodes. It is clear that when using these retrospective measures some accuracy will be lost because the questionnaire relies on the participant's memory of how they normally behave. A more precise measure would be to use a daily diary to assess the level of co-rumination. Only one study has looked at co-rumination using a daily diary methodology. White and Shih (2012) conducted a study with 279 college students, in which participants were required to complete a mood diary twice a day for a period of 7 days. The morning survey recorded depressed mood and the evening survey recorded within-day co-rumination, daily stressful life events, and depressed mood. Participants also completed baseline measures of co-rumination and depressive symptoms. The researchers found that higher daily co-rumination scores significantly predicted worse evening mood when controlling for morning mood and daily stressful events. However, gender did not moderate the relationship between co-rumination and depressed mood. Higher levels of baseline co-rumination predicted a stronger association between daily-stress and depressed mood (White & Shih, 2012). This research supports the relationship between co-rumination and depressive outcomes that Rose (2002; Rose et al., 2007) suggested. However the gender difference she suggested was not supported.

Two further recent diary studies have been conducted (Bouchard & Shih, 2013; Nicolai, Laney, & Mezulis, 2013), however they both used weekly diary measures rather than daily. Nicolai et al. (2013) assessed whether particular types of stressors are more predictive of depressive outcomes than others. Using an adolescent sample (age 14-19) in an 8-week diary design, they found that rumination and co-rumination about social and dependent events positively predicted depressive symptoms. However this was not the case for independent or non-social events (due to the predominantly female sample, no gender differences were reported). This research suggests that it might not just be any type of co-rumination which leads to depressive outcomes but co-rumination (and rumination) about particular types of events; notably ones that are social in nature and events for which the individual feels responsible, or that they have some control over (*dependent* rather than *independent* events in Kercher & Rapee's, 2009, terms).

The research from Bouchard and Shih (2013) extended the work of Hankin et al. (2010; see 1.3.1) by adopting a similar design but also including gender analyses. Further, unlike the work of White and Shih (2012) and Nicolai et al. (2013), the research did not focus on depressive outcomes of co-rumination. However, it did contribute to explaining why co-rumination may lead to depressive outcomes for women. They suggested that it is females' higher levels of interpersonal stress generation that leads to depressive symptoms and they found in their research that women did report significantly more stress generation and this gender difference was partially mediated by neediness and co-rumination. Although stress generation will not be examined in this thesis it is important to note that researchers are attempting to explain the higher rates of depression in females and that stress generation may be a

factor. However, what this thesis will address is whether these gender differences exist when co-rumination is examined experimentally and using the diary method.

The research by White and Shih (2012) presents some interesting findings. Overall, the results of the study support Rose's (2002; Rose et al., 2007) suggestion that co-rumination can lead to negative outcomes but it does not support the gender difference that Rose and colleagues found in their study (Rose et al., 2007). In addition, the fact that the baseline and daily co-rumination measures presented matching findings is of particular interest. This indicates that their general CRQ score is accurately measuring their daily co-rumination. This will be further analysed in this thesis. The diary studies that are presented will examine if daily co-rumination leads to depressive outcomes and whether there is a relationship between the CRQ and daily co-rumination reported in the diaries.

1.3.7 Longitudinal Research

The majority of research into co-rumination has adopted a single time-point method (Starr & Davila, 2009; Stone et al., 2010; Tompkins et al., 2011), so it does not have the capability for longitudinal analysis which was present in Rose et al.'s (2007) 6-month longitudinal study. Only one other study has examined the emotional outcomes of co-rumination longitudinally. Hankin et al. (2010) conducted a thorough 4-wave longitudinal study over a 4-month period (5 weeks between time-points) examining the levels of co-rumination and internalising symptoms (assessing emotional difficulties) of 350 participants (aged 11-17). They found that co-rumination did predict elevated trajectories of depressive and anxious symptoms over time. The results also supported the findings of Nicolai et al. (2013); dependent interpersonal stressors (interpersonal stressors which the participant felt they had some control over

or were responsible for) partially mediated the longitudinal association between baseline co-rumination and later internalising symptoms. Although girls did score higher than boys on baseline co-rumination, there were no significant interactions between gender and co-rumination for internalising symptoms. Therefore, although this study supports the relationship found between co-rumination and internalising symptoms, it does not support the gender difference that Rose et al., (2007) found (that co-rumination was linked to internalising symptoms for girls, but not boys). Again, as with the Stone et al. (2010) research, this could be due to a smaller sample size, but it is clear that this gender difference may not be particularly strong, especially since Rose et al. (2007) only found a clear effect of gender when they analysed the data from girls and boys separately. It is clear that these gender differences need further investigation; one study within this thesis (Chapter 3) will address the outcomes of co-rumination over a six-month period.

1.3.8 Self-disclosure, Rumination, and Co-rumination

Although Rose's research highlighted the importance of the relationship between self-disclosure, rumination, and co-rumination, most subsequent research into co-rumination has not examined self-disclosure and rumination despite their obvious importance. None of the subsequent studies which include co-rumination as a factor, also include self-disclosure, but there are a small number of studies which examine the relationship between co-rumination and rumination. Jose et al. (2012) examined the relationship between social anxiety, co-rumination, and rumination in a three-wave longitudinal study (N= 575) and found that adolescents who were high in social anxiety were more likely to ruminate and this, in turn, predicted higher levels of co-rumination. Although there was no direct relationship between co-rumination and

anxiety, the study does support Rose et al.'s (2007) suggestion that there may be a cyclical relationship between co-rumination and internalising symptoms, and this may also include rumination as a factor. As suggested previously, this was also supported by McLaughlin and Nolen-Hoeksema (2012) who suggested that, 'Rumination also may contribute to internalizing symptoms in adolescents by fuelling engagement in co-rumination' (p. 593).

Calmes and Roberts (2008) also investigated the relationship between rumination and co-rumination. They found that co-rumination mediated the relationship between gender and depression (females were significantly higher on depression); however, this was not the case after controlling for rumination. This supports Rose's (2002) suggestion that co-rumination is linked to depression because of co-rumination's shared variance with rumination. Therefore, the research by both Jose et al. (2012) and Calmes and Roberts (2008) suggests that the relationship between co-rumination and internalising symptoms (depression and anxiety) is mediated by rumination. However the suggestion that rumination and co-rumination are separate constructs needs further investigation to examine what effect co-rumination is having on depressive outcomes. To examine causality, the research in this thesis will encourage participants to engage in co-rumination to examine what outcomes co-rumination has, using the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991) as a control.

The differing emotional outcomes of co-rumination and rumination will be examined in this thesis. Research into self-disclosure will also be conducted and this will be of particular interest since no studies since Rose's (2002; Rose et al., 2007) research have examined self-disclosure as a factor in the outcomes of co-rumination.

Obviously it is crucial to include all the factors to examine how each of them contributes to the positive and negative outcomes of co-rumination.

1.4 Methodological Concerns when Studying Gender Differences and Co-rumination

1.4.1 Co-rumination Questionnaire and Coding

Rose and colleagues' (Rose, 2002; Rose et al., 2007) studies were some of the first to investigate maladaptive effects of close, seemingly well-functioning, friendships. However there are several problems which need to be addressed with these first two co-rumination studies. Primarily, because the research is not experimental, we cannot examine if there is a causal link between co-rumination, depression, and anxiety. As previously stated, there are three observational studies (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010; Rose et al., 2005) which have examined the relationship between co-rumination and internalising symptoms. However, the Byrd-Craven research only looked at the relationship between co-rumination and anxiety, using exclusively female samples. By contrast, the Rose et al. (2005) study did find that there was a significant correlation between coded co-rumination and internalising symptoms, and found that girls co-ruminated significantly more than boys. However, the researchers did not report whether gender mediated the relationship between co-rumination and the negative emotional outcomes. Although these studies employed the co-rumination coding scheme (CRCS), they did not experimentally manipulate co-rumination. There are no studies to date which experimentally assess the adaptive or maladaptive outcomes of co-rumination. It is clear that experimental research is needed to examine Rose's (2002; Rose et al., 2007) proposed gender differences and examine whether experimentally manipulated co-rumination has any effect on

depressive symptoms. The experimental research will also allow us to disentangle the effects of co-rumination compared with rumination.

I was also concerned that the CRQ in its standard form would not be specific enough to assess the individual friendships in each study. Therefore, in addition to the standard CRQ (which is used in Study 3 of this thesis), the CRQ was also amended to make it more specific to the pairs of friends who would be participating in each study (Studies 1, 2, and 3). Therefore a friend-specific CRQ measure was created which asked participants to report on how they behave specifically with the friend they are participating in the study with, rather than the close friends in general used in the standard CRQ. In this way I could get an accurate assessment of co-rumination in each friendship.

Although the self-report CRQ measure was amended for this specific research, using a self-report measure alone is not a thorough assessment of co-rumination. The existing research (apart from the three studies presented above) largely used self-report measures, requiring the participants to remember how they normally behave when discussing problems with friends. This leaves the research open to problems with recall. It could also be the case that participants give a report of how they believe they behave, rather than how they actually behave, which may be due to gender stereotypes (e.g., females believing that they behave in this way more often than they do). The alternative, which can be used in conjunction with the self-report method (CRQ), is the coding scheme (CRCS; Rose et al., 2005) used in the three observational studies. In this way the co-ruminative conversations can be video recorded and subsequently coded for the level of co-rumination. We already know from the Byrd-Craven et al. research (2007; 2010) that the self-report measure and the

coded measure lead to differing effects (the CRCS led to increased anxiety, whereas the CRQ did not), but it would clearly be of interest to know if the two measures (CRQ and CRCS) correlated, to examine if they are indeed measuring the same aspects of co-rumination. Although the correlational relationship between the two was not reported by any of the three observational studies, the disparity between the two found in the Byrd-Craven et al. (2007; 2010) research might be due to the fact that there are discrepancies between the self-report measure and the observed co-rumination coding. Not only does the self-report co-rumination measure (CRQ; Rose, 2002) suggest that co-rumination is more than what occurs in a single interaction but, of the 9 content areas, three of the areas clearly cannot be assessed observationally in a single interaction: frequency of discussing problems; discussing problems instead of engaging in other activities; discussing the same problem repeatedly. One might assume that increasing the frequency might increase the intensity of the negative outcomes, but it could be the case that the increased frequency of these activities leads to a normalising of this behaviour, which therefore decreases the emotional impact. It is clear that these relationship variables are needed to assess what impact the frequency of the discussions has on the emotional outcomes.

The difference between the CRQ score and the coded score could also be attributed to the fact that the amount of co-rumination that is coded could be distorted by expressed anxiety or depression (especially since item 4 on the coding scheme is ‘dwelling on negative affect’ Rose et al., 2005). There could also be researcher bias if the coders know that co-rumination leads to increased depression and anxiety. Therefore the co-rumination coding within this thesis will be conducted by individuals who are unfamiliar with the research, but who have been trained in the coding scheme. The coding will also be checked for inter-rater reliability.

The coding scheme has only been used previously in a small number of studies and it is clear that its potential has not yet been fully exploited. The coding scheme will be used throughout the experimental studies within this thesis and the relationship between the CRQ and coded co-rumination scores will be examined along with the effects that they each have on positive (friendship quality) and negative (depression and anxiety) outcomes.

1.4.2 Diary Research

Another way to address the problem of using single-time self-report measure is to use the diary method. Frequency of problem discussions which cannot be assessed by the coding scheme can be examined using diary research. The diary method could be interval-contingent (e.g., every evening) or event-contingent (e.g., every time a problem occurs; Wheeler & Reis, 1991) and using the diary method would lessen the possible recall problems of the single-time CRQ measure, and would allow for greater accuracy in reporting about problem discussions. Diaries can also be compared with single-time-point studies to examine if participants' memories of past discussions are affected by factors such as the importance of the problem being discussed.

The only daily diary study that has specifically focused on the negative outcomes of co-rumination (White & Shih, 2012) did not really examine the frequency of the co-ruminative episodes over time. The researchers only examined the amount of co-rumination within each day and not across the whole diary period. Future research will need to broaden these daily measures to investigate the co-ruminative nature of the relationship over time. This more comprehensive approach will be adopted in the diary research in this thesis.

1.4.3 Dyadic Nature of Co-rumination

Another issue that the studies assessing both members of a friendship pair have neglected is the dyadic nature of the data. Although the CRQ is designed to examine co-ruminative tendencies in close friendships, most researchers have only focussed on the perspective of one participant. We could assume that this should be representative of their relationships as a whole because it is asking about their relationships, not about their individual tendencies. However, this would assume that the participant has an accurate view of how they discuss problems in their relationships that is identical to their friend's view, and that it is the same across their close friendships. It is clearly important to check whether participants' friends experience the relationship similarly. Therefore individual friendships need to be examined (in dyads), before the research is broadened to perceptions of more general co-ruminative styles across multiple friendships (as assessed in previous research). Further, the experiences of both friends need to be assessed to examine if the experience of discussing problems they report is similar, or if they have different perceptions of how they discuss problems with each other.

Only one recent (correlational) study (using the CRQ) has examined data from both participants within a dyad. Schwartz-Mette and Rose (2012) re-analysed a subsample (N = 247 dyads) of the data from the Rose et al. (2007) study to see the effect that the dyadic nature of the data had on emotional outcomes. They reported that there was a fair degree of agreement between the friends' co-rumination scores at the start of the study (intraclass corrlation = .35), suggesting that the friends had a similar co-ruminative style. Although the researchers took a subset of reciprocal friendships from the original data, they still used the CRQ in its original form. This means that participants were reporting on their close friendships in general rather than this

specific friendship. Therefore we would expect this positive correlation to be stronger when the CRQ is adapted to examine the co-rumination levels in one specific relationship.

Although the members of the friendship pair were indistinguishable in the Schwartz-Mette and Rose (2012) study because the study was correlational, it would clearly be of interest, when conducting experimental research, to be able to identify each member within a dyad[1] (Kenny, Kashy, & Cook, 2006). This is because it would be interesting to see if the individual differences of each member contribute to their co-ruminative style and its emotional outcomes. The members of a friendship pair have not been identifiable in any of the observational research (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010; Rose et al., 2005) and it will be of interest to examine if two friends perceive their relationship in the same way and how this manifests itself in actual co-ruminative conversations. Further, it is important to examine if problem possession (i.e., whose problem is being discussed) makes a difference for the emotional outcomes of both participants within the dyad. Problem possession was used as an independent variable in the observational and experimental studies reported in this thesis. This allowed the examination of whether there are cross-dyad effects, i.e., whether one person's discussed problem had an emotional effect on their friend with whom they were discussing it. Identifying problem possession also allowed the analysis of how much each member's tendency to co-ruminate had an effect on their friend. It was also a key consideration that there was existing research

[1] Kenny, Kashy, and Cook (2006) present different techniques for analysing dyadic data depending on whether members of the dyad are distinguishable or not. One advantage of making dyad members distinguishable is that effects of the distinguishing variable can be assessed. The present research distinguishes dyad members on relevant variables such their role in the problem discussion. This dyad member identification is included in the first three studies in this thesis as a way of analysing the differing effects that each member of the dyad has on their friend. Especially in studies 2 and 3 this allows me to examine whether there are differing emotional outcomes for the person who is presenting their problem or the friend who is 'listening' to the problem. It is necessary to treat the data as dyadic because the participants are in close friendships and should therefore not be treated as independent.

on problem discussions (discussed in 1.1) and therefore there was a solid theoretical framework to build on.

Although Kenny et al. (2006) do suggest that Multilevel Modelling, such as Hierarchical Liner Modelling (HLM), can be used with nested data (such as the experimental and diary data within this thesis), repeated-measures ANOVAs were used throughout. This method of analysis was necessary for these studies because of limitations of sample size and missing data. Kenny et al. (2006) suggest that there should be at least 40 observations at each level to meet the criteria for using HLM; the studies presented within this thesis do not meet these criteria. In addition the missing data within the diary studies[2] meant that I was unable to conduct HLM and had to reduce the diary data (predominantly comparing problem days with days when no problems occurred).

1.5 Issues Not Addressed by Previous Research and Aims of This Thesis

Although the existing research covers a broad range of populations and environments, there are still many areas that would benefit from future research and many issues not addressed. The research within this thesis will focus on observational, experimental and diary studies, and its aims are to expand the field of co-rumination and to more comprehensively examine some weaker areas in the existing literature.

Clearly there is a need for observational and diary research in order to confirm that the gender differences suggested by Rose (2002; Rose et al., 2007) exist. Co-rumination needs to be manipulated experimentally to test if there is a causal

[2] See studies 4, 5, and 6 for further details.

relationship between co-rumination and later depression and anxiety, and whether this relationship holds for some populations but not others. It will also be interesting, considering the low rates of reported co-rumination in males from previous research (Rose, 2002; Rose et al., 2007), to examine whether any gender differences arise in the emotional outcome. As discussed above, further longitudinal research needs to supplement the mainly cross-sectional findings published so far. This will allow direct comparison with Rose et al.'s (2007) research and will reveal how co-rumination unfolds over time. These issues will be addressed in this thesis.

Although the majority of co-rumination research focuses on children and adolescents it is clear that co-rumination also occurs in adulthood, with one study showing high levels of co-rumination in early adulthood (Calmes & Roberts, 2008). Further investigation into co-rumination in adult populations is needed. However, it would be advantageous to also conduct experimental research particularly with younger participants to investigate if co-rumination is having the effect that has been suggested by previous correlational research (Rose, 2002; Rose et al., 2007). This thesis will present research with children, adolescent, and adults.

I feel that it would be unwise to investigate co-rumination in a clinical sample given the ethical concerns and the vulnerability of the sample. Therefore all the participants used in this thesis will be from non-clinical samples. However, it is clear that if co-rumination is found to have a negative effect as a result of the work presented in this thesis, then experiments with clinical samples will be necessary in future in order to allow for a complete understanding of co-rumination and the development of preventative measures for depression in adolescence.

As research into co-rumination is now expanding, it has become clear from two very recent studies that both dyadic and diary research provide very valuable insights into the nature of co-rumination. As was previously highlighted, diary research is crucial for a more comprehensive approach to analysing the negative repercussions of co-rumination. It is clear that we need to examine how co-rumination affects individuals over time, as co-rumination encompasses a whole relationship style rather than just a single co-ruminative interaction.

Expansion into dyadic research would allow researchers to examine both members of a friendship pair and examine how their own tendencies and behaviours manifest within the relationship and what effect these have on participants' emotional outcomes and wellbeing. In the three observational and experimental studies (Chapters 2, 3, and 4), I will collect data from both participants within a dyad to assess the nature of the relationship from the perspective of both individuals. This enables assessment of whether dyad members have complementary co-ruminative styles and whether there is a difference in affect depending on who is presenting their problem for discussion. This differentiation of dyad members is an untapped resource which has not been examined by prior researchers. One of the primary reasons for my interest in this topic is that, although the co-rumination measure assesses the relationship rather than the individuals, previous research has not truly taken advantage of this and has instead focused on individuals' tendency to co-ruminate rather than looking at both members of the friendship. There is a richness to dyadic data and I believe that assessment of this will allow us to examine not only the nature of co-rumination but also deeper aspects of relationships in general; not only whether friends have shared co-ruminative styles, but also how an individual can affect their friend's mental health and wellbeing. I will investigate these unaddressed elements

from previous research within this thesis and expand on the valuable work which has already been conducted.

It is further apparent that the relationships between co-rumination, rumination, and self-disclosure found in questionnaire measures need to be examined experimentally. An experimental design will allow us to investigate if manipulated co-rumination leads to closer emotional bonds and increased internalising symptoms, and if any such relationships are mediated by self-disclosure and rumination. Previous research has only really examined parts of the relationship and it is clear, from Rose et al.'s (2007) research that the three factors (co-rumination, relationship quality, and internalising symptoms) are all interlinked and any complete experimental assessment of co-rumination will need to include these three variables. The final experimental study in this thesis (Chapter 4) addresses the relationship between these three variables and examines whether they are distinct processes and to what extent they affect relationship satisfaction and internalising symptoms.

The experimental research within this thesis will focus exclusively on co-rumination in close same-sex friendships for a number of reasons. First of all, previous research has highlighted that both males and females interact more with same-sex than opposite-sex peers (Maccoby, 1998; Martin & Fabes, 2001). Therefore, it would seem logical to focus on this type of relationship. In addition, especially in younger samples, using cross-gender friendship pairs might cause problems when pairs of friends have been previously romantically involved or where one party may be attracted to the other. Obviously this could also be the case in same-sex friendships, but the prevalence will likely be lower. It is clear that males and females do have

close friends of the opposite sex and, although it is beyond the remit of this thesis, it is clearly an area ripe for future research.

Finally, the overarching purpose of this research is to examine if Rose's questionnaire based research (2002; Rose et al., 2007) is replicable using experimental methods. The research will examine if co-rumination does have the same effects on relationship satisfaction and internalising symptoms (depression and anxiety) that have been suggested in the existing research, but also whether the maladaptive effects hold true only for females. In this thesis, I will attempt to both extend and elaborate on the previous research into co-rumination; extending into new untapped research areas, such as experimental research and differentiation between dyad members, and filling in the gaps that have occurred in the literature, such as particular elements of diary research (e.g., measuring associations between daily co-rumination and the co-rumination questionnaire). Although this thesis cannot address all of the issues which have arisen out of previous research (reviewed above), I believe that it addresses the key issues that have been presented and represents a clear and natural progression from its predecessors, leading the way for future research which can build upon its findings.

2 EFFECTS OF CO-RUMINATION DURING PROBLEM DISCUSSIONS

2.1 Abstract

The study presented in this chapter examined whether participants' tendency to co-ruminate, and the observed levels of co-rumination during a conversation, influences their levels of affect whilst discussing a problem. Pairs of friends (aged 18-29) were recruited for the current study to examine co-rumination within close same-sex friendships. Both participants discussed one of their own problem topics with their friend for five minutes and then completed video-cued recall ratings of their own, and their friend's, happiness and calmness during the conversation. Each participant reported their tendency to co-ruminate with their friend before the conversation and the conversations were also coded by external raters for their levels of co-rumination. Results showed that participants felt less happy and less calm during discussion of their own problems than they rated their friends as being. Although self-reported co-rumination (CRQ) had minimal effects on calmness, observed co-rumination (CRCS) was a reliable negative predictor of overall happiness. There were no gender differences in self-reported or coded co-rumination. Although observed co-rumination was a negative predictor of happiness, the effect was the same for males and females.

2.2 Introduction

Previous research has found that co-rumination leads to negative outcomes for women but not men (Rose, 2002; Rose et al., 2007). The research also goes some way to explaining why girls have closer friendships than boys (Bukowski et al., 1994), which should buffer against emotional distress (Bukowski et al., 1996), but also have higher rates of depression (Nolen-Hoeksema & Girgus, 1994). If, as Rose (2002; Rose et al., 2007) suggests, co-rumination has both adaptive (closer friendships) and maladaptive effects (anxiety and depression), and the maladaptive effects only occur for females, this may explain the apparent contradictions in findings, and account for females' higher levels of depression.

Rose (2002) found that co-rumination significantly positively correlated with relationship satisfaction for both males and females, but significantly positively correlated with internalising symptoms (depression and anxiety) for females only. Rose et al. (2007) found that female participants' tendency to co-ruminate positively predicted their levels of depression and anxiety six months later. They also found that higher levels of depression, anxiety, and friendship satisfaction at time 1 predicted higher levels of co-rumination at the six-month follow-up. However, it must be noted that gender did not interact significantly with co-rumination in predicting depression and anxiety when findings were analysed with a hierarchical regression, raising possible questions about the reliability of gender differences in the effects of co-rumination.

In both studies, Rose (2002; Rose et al., 2007) found that girls co-ruminated more than boys, and that adolescent girls scored significantly higher than younger female children. By contrast, there was no difference between co-rumination scores of male

children and adolescents. Some subsequent co-rumination studies have also found support for this gender difference (Calmes & Roberts, 2008; Haggard et al., 2011; Hankin et al., 2010; Jose et al., 2012; Rose et al., 2012), whereas others have not (Stone et al., 2010; White and Shih, 2012). Although Rose's (2002; Rose et al., 2007) original samples were comprised of children and adolescents, research suggests that co-rumination also happens in adulthood (Byrd-Craven et al., 2010; Calmes & Roberts, 2008; Haggard et al., 2011; White and Shih, 2012).

Further research into co-rumination has largely supported Rose's original findings. Byrd-Carven et al. (2010) found that observed levels of co-rumination (coded using the CRCS described in the previous chapter and also used in the present study) predicted post-problem-discussion Cortisol levels (as a measure of anxiety) in a sample of 44 female friendship dyads (of undergraduate students). However, it may have just been problem talk in general rather than co-rumination specifically which caused anxiety, because Cortisol rose in both experimental and control conditions. In an earlier study using the same design (Byrd-Craven et al., 2007), this finding was only significant in the experimental (problem talk / co-rumination) condition and not in the control condition (discussing designing a recreation centre), suggesting that co-rumination increases the level of anxiety after a problem discussion. However, as the sample for both studies was entirely female there could be no analysis of gender differences. This observed effect of co-rumination needs to be examined in a sample of both males and females to examine if there are any gender differences.

Hankin et al. (2010) conducted a 5-wave 4-month longitudinal study of co-rumination in 350 male and female children and adolescents aged 11-17. Findings supported the effects of co-rumination obtained in Rose's (2002; Rose et al., 2007) research.

However, unlike in the original research, no gender differences were found in the effects of co-rumination. The researchers reported a reciprocal relationship between co-rumination and internalising symptoms (anxiety and depression), with baseline co-rumination significantly positively predicting internalising symptoms over time and baseline internalising symptoms significantly positively predicting co-rumination over time (Hankin et al., 2010). White and Shih (2012) also failed to find gender differences using a 7-day diary study (N = 279, college students). In their study, base-line co-rumination positively predicted the strength of association between daily stress and depressed mood. Tompkins et al. (2011) found support for Rose's (2002; Rose et al., 2007) gender difference in a sample of 149 students (aged 14-19). Co-rumination predicted internalising symptoms while controlling for gender, but also being female predicted higher levels of co-rumination which, in turn, predicted greater internalising symptoms. Therefore, these predominantly correlational studies (all except Byrd-Craven et al., 2007, and Byrd-Craven et al., 2010, which were observational) support a link between co-rumination and internalising symptoms but the gender difference suggested by Rose (2002; Rose et al., 2007) does not always occur.

Research which involves observation of actual problem discussions, and observational coding of co-rumination, also avoids the possible effects of gender stereotypes distorting the self-reporting of co-rumination in questionnaires. It may be the case that women are over-reporting their tendency to co-ruminate on the CRQ or that men are under-reporting it. This may be because self-disclosure is seen as a positive action for women, which fosters close emotional bonds (Calmes & Roberts, 2007), whereas it may be seen as a sign of weakness for men. This difference has been found before between observational and self-report measures (e.g., Verhofstadt, Buysse, & Ickes, 2007) and therefore it is important to assess co-rumination using observational

methods. Observational research can more accurately assess the extent to which participants co-ruminate during a conversation, and whether there is genuinely a gender difference between the levels of co-rumination for men and women.

No previous studies of this kind have included male participants (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010), so the current research, which employs both men and women, aimed to broaden our understanding of gender differences in co-rumination. Further, although Rose and her colleagues' (2007) research was conducted over a six month period, it is clear that co-rumination can have immediate effects (e.g., Byrd-Craven et al., 2010; Rose et al., 2005). For this reason, and due to the demands of the video-cued recall, this study only examined the emotional outcomes of co-rumination for men and women within the two conversations.

The only previous observational study that had the potential to examine gender differences was conducted by Rose et al. (2005); they investigated the levels of co-rumination within a conversation using the co-rumination coding scheme (CRCS, see chapter 1 for details). They employed 24 friendship pairs (12 male and 12 female; aged 15-16) and asked each pair to complete measures of friendship quality, depression and anxiety, and then to engage in 16 minutes of problem talk. Using the CRCS, Rose et al. (2005) found support for findings from her earlier research (Rose, 2002); females co-ruminated significantly more than males during the conversation and their levels of co-rumination in the conversation were positively correlated with both friendship quality and internalising symptoms (both measures taken as a questionnaire before the problem discussion). However, the authors did not report whether gender moderated any of the effects found for friendship quality and internalising symptoms. Further, they did not present any findings about associations

between the two participants' co-rumination scores or report any measures of affect taken during the conversation to examine what effect co-rumination in the conversation had on immediate levels of affect.

The current study assessed effects of co-rumination tendencies on affect during an ongoing problem discussion. This is an extension of previous research, which lacked some crucial elements such as identification of the dyad members and examining if gender does moderate the relationship between co-rumination and the negative emotional outcomes. I predicted similar patterns of results to previous research; both self-reported co-rumination and observed co-rumination should significantly positively correlate with sadness and anxiety (i.e., negatively correlate with happiness and calmness) during the problem discussions and this effect should only be found for female participants. In addition, Rose found a significant positive correlation between co-rumination and rumination (2002; Rose et al., 2007, see Chapter 1), and I expected to replicate this finding in the current study. Also, because the two concepts overlap significantly, and the maladaptive elements of co-rumination are thought to be caused by co-rumination's overlap with rumination (Rose, 2002, see Chapter 1), I expected that higher levels of co-rumination and rumination would correlate positively with sadness and anxiety during the problem discussion.

An additional issue of interest is whether co-rumination scores from each friend are interrelated. Until recently, no studies had investigated the relationship between friends' co-rumination scores, despite the fact that researchers had collected the results from both members of the dyads (Byrd-Craven et al., 2007; Byrd-Craven et al., 2010; Rose et al., 2005). The current study aimed to address these shortcomings and investigate data from both participants within a dyad using two conditions where

participants present their own problem or discuss their friend's problem. This design allows comparison of the effects of discussing a problem, and listening to a friend's problem, for both members of the dyad. I used the CRCS and baseline co-rumination scores (CRQ) to assess effects of co-rumination on each participant within the dyad for each conversation.

Although several studies have collected co-rumination data from both CRQ and from conversation coding, correlations between the scores obtained from these procedures have rarely been reported. I predicted that there would be a significant positive correlation on the assumption that the conversation in the laboratory is likely to be representative of typical conversations with friends (particularly, because participants who were recruited were aware that they would be discussing problems). However, even high-co-ruminators sometimes have non-co-ruminative conversations, so it is possible that this assumption may not hold.

Previous research has also not indicated whether there are cross-friend correlations between the baseline co-rumination scores of dyad members. This is mainly due to the fact that, in its original version, the CRQ assesses close friendships in general rather than one specific friendship. For the current study, the CRQ was amended to examine the specific dyad participating in the research. I predicted that there would be a positive cross-friend correlation because the present version of the CRQ was intended to measure co-rumination within that specific relationship, so it should assess their joint co-ruminative style rather than their individual co-ruminative tendencies; the majority of the questions in the co-rumination questionnaire are phrased as 'we' rather than 'I', so, again, I expected the results to be a reflection of shared co-ruminative style.

2.2.1 Hypotheses

The following hypotheses were investigated:

1. CRCS scores (CRCS 1 and CRCS 2), for the two conversations for each pair, will positively correlate. Self-reported co-rumination (CRQ) for participants within a dyad (CRQ A and CRQ B) will positively correlate. CRQ scores from each participant will positively correlate with the CRCS scores for each of their problem discussions. CRQ and rumination scores will correlate.

2. Participants' own CRQ and CRCS scores, for their problem discussion, will have a negative effect on their own happiness and calmness levels.

3. In keeping with Rose et al.'s (2007) research, gender will moderate the effects of co-rumination on affect, with stronger effects for female than male participants.

2.3 Method

2.3.1 Participants

Participants were pairs of same-gender friends, aged 18-29 (M = 21.6; SD = 3.0), who had been friends for at least six months. The sample included 22 males (11 pairs) and 26 females (13 pairs). However, only 18 males (9 pairs) and 24 females (12 pairs) were included in the final analysis due to failings in computer proficiency and language difficulties. Participants were mainly students (77%) and they were compensated for their participation with £10 payment or equivalent course credit.

2.3.2 Design

The study used a 2 (gender; between-subjects) x 2 (person; P1 vs. P2, within-pairs) factorial mixed design to analyse data separately for each of the two conversations.

Within each conversation, the person presenting their problem for discussion was labelled as P1 and their friend was labelled as P2. Individual differences in co-rumination and rumination were also used as continuous predictors of outcomes. The main dependent variables concerned ratings of experienced affect.

2.3.3 Measures[3]

Demographic Questions. Participants were asked their age, gender, employment status, education level, and ethnicity. Participants were also asked how long they had been friends (in years and months).

Co-Rumination (CRQ; Rose, 2002). The 27-item CRQ assesses the individual's tendency to co-ruminate with their close same-sex friends. In the current study, the measure was modified and participants were asked to respond to the questionnaire focusing exclusively on the friend they were participating with in the current research, rather than their same-sex friends in general. The CRQ has nine content areas; (1) frequency of discussing problems, (2) discussing problems instead of engaging in other activities, (3) encouragement by the focal person of the friend's discussing problems, (4) encouragement by the friend of the focal person's discussing problems, (5) discussing the same problem repeatedly, (6) speculation about causes of problems, (7) speculation about consequences of problems, (8) speculation about parts

[3] Data used in the current study were collected as part of a research project conducted during the author's MSc training. The results presented here are based exclusively on further analyses conducted specifically for this doctoral thesis (using the video recordings from the study). The measures listed in the present section are a combination of items from the original questionnaire and new measures (coded from the videos) included for this research.

of the problem that are not understood, and (9) focusing on negative feelings (Rose, 2002, p. 1832). Each of the nine content areas is assessed with three questions. Participants responded on a 5-point Likert scale, which ranged from 'Not at all true' (1) to 'Really True' (5), and the score was calculated as the mean of the ratings across the 27 items. Statements included 'we talk about problems that my friend or I are having almost every time we see each other' and 'when one of us has a problem, we talk to each other about it for a long time'. The measure had very good internal reliability (Cronbach's α = .97). For the full measure please refer to Appendix 1.

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). The 22-item RRS was used to measure participants' tendency to ruminate, examining factors such as 'reflection' and 'brooding'. Participants respond on a Likert scale of 1 (almost never) to 4 (almost always) to indicate how often they had been thinking or feeling that way. Statements included 'think about how passive and unmotivated you feel' and 'think about how alone you feel'. The final RRS score was the sum of ratings across the 22 items. The measure had good internal reliability (Cronbach's α = .83).

Problem Issues. Participants were asked to describe two ongoing problems. Two problems were required in case the participant was uncomfortable talking about their first problem on camera. The most important problem, which each participant was comfortable discussing, was selected for the discussion.

Affect Ratings (video-cued recall). Participants reported on their own and their partners' happiness ('How happy were you at this point?') and calmness ('How calm were you at this point?') at 15 separate 10-second intervals during replay of the edited videotape of their conversation. Ratings used 7-point Likert scales running from 1

(happy / calm) to 7 (sad / anxious). However, I reversed the scores for the happiness and calmness scales; therefore happiness is on a scale of (1 sad, to 7, happy) and calmness is on a scale of (1 anxious, to 7 calm). The 15 data-points for each of the four affect items (happiness and calmness for self and other) for each conversation were aggregated into single scores. These aggregated scores were used in the analyses reported below.

Co-rumination Coding Scheme (CRCS; Rose et al., 2005). The co-rumination coding scheme is designed to allow raters to code observed interactions. In the current study, the videos from each conversation were used to assess to what extent each pair had been co-ruminating. Four areas were assessed (Encouragement, Speculating, Dwelling, and Rehashing). Two raters (who were blind to the hypotheses) independently coded each of the four areas on 5-point Likert Scales from 1 (not at all / very little) to 5 (very much), with one rater coding all videotapes, and the other coding a subset of 24 out of 44 videotapes for the purposes of assessing inter-coder reliability. The two raters' codings were significantly positively correlated for three out of the four areas: encouragement, $r(24) = .50$, $p = .013$; rehashing, $r(24) = .54$, $p = .007$; and dwelling, $r(24) = .50$, $p = .012$. The two coders' ratings did not significantly correlate for speculating, but the correlation was still moderately positive, $r(24) = .31$, $p = .140$. In keeping with the original coding scheme, the average global co-rumination score (CRCS) was calculated as the average of the scores for the first four items. The inter-coder correlation for these CRCS scores was positive and significant, $r(24) = .64$, $p = .001$.

Naturalness of Conversation

Participants were asked to report on a 7-point Likert scale from 1 (not at all) to 7 (very much) how similar the conversations they had in the laboratory were to the conversations they usually had. They were also asked to indicate, on an identical 7-point Likert scale, how natural they found the conversations in the laboratory compared to the conversations they usually had. Participants reported that they found conversations to be similar to those they usually had (M = 5.44, SD = 1.10) and natural (M = 5.00, SD = 1.30).

2.3.4 Procedure

All participants spent approximately 30 minutes completing the online consent form and questionnaire measures (CRQ, RRS, demographic, and problem issues), and on completion they were invited, with their friend, to come into the laboratory (Department of Experimental Psychology, Oxford University) for the problem conversations. On arrival, participants were given verbal instructions about what the study involved. They were told they would be asked to have two problem conversations which would be video-recorded. Each participant would discuss their most important problem, which they had submitted as part of their online questionnaires (if they were not comfortable doing so they would discuss the second most important). Each participant would have a chance to discuss one of the problems that they had nominated. The participants completed the two problem discussions and were asked during the conversations to discuss them as naturally as possible (as if they were talking in private). The experimenter stopped each problem conversation after 5 minutes.

After completing both conversations, participants were asked to perform a filler task (further questionnaires which were not used for the current study) while the experimenter edited the videos of the conversations in preparation for the video-cued recall procedure. The videos for both conversations were edited down from 5 minutes each to 2.5 minutes (always from 1 minute into the conversation, to give the participants time to relax into normal conversation, to 3.5 minutes in) and each was split into fifteen 10-second clips.

Each participant completed the following rating task in a separate cubicle: participants watched the 2.5-minute video of one conversation once without any pauses to familiarise them with watching the clip and the content of it, then participants watched the same conversation split into fifteen 10-second clips (in chronological order). Participants completed a video-cued recall task (VCR; Gottman & Levenson, 1985; see Simons & Parkinson, 2009) in which they answered four questions after each 10-second clip. Two of these questions concerned participants' own happiness/sadness and calmness/anxiety over the period covered by the clip, and the other two concerned their friend's happiness/sadness and calmness/anxiety.

After completing the VCR procedure for the first conversation, the identical process was repeated for the other conversation. After the completion of the VCR for the second conversation, participants were paid £10 and fully debriefed about the nature of the experiment. The experiment lasted 90 minutes on average in its entirety.

2.4 Results

2.4.1 Correlations

Friends' co-rumination scores (CRQ A, the person presenting their problem for discussion in conversation 1, and CRQ B, the person presenting their problem for discussion in conversation 2) did not significantly intercorrelate, $r(21) = .23$, $p = .326$. This was checked using a reduced CRQ which only included 'we' rather than 'I' questions (omitting questions 3, 4, 7, 8, 11 and 12) however the results were still non-significant, $r(21) = .25$, $p = .283$. There was a significant positive correlation for CRCS scores across the two conversations (CRCS 1 and CRCS 2), $r(21) = .63$, $p = .002$. However, CRCS scores for neither conversation correlated significantly with self-reported co-rumination scores for either of the two participants: CRQ A with CRCS 1, $r(21) = .21$, $p = .352$ or CRCS 2, $r(21) = .29$, $p = .204$; or CRQ B with CRCS 1, $r(21) = .23$, $p = .314$, or CRCS 2, $r(21) = .29$, $p = .210$. None of the individual co-rumination coding items (Encouragement, Rehashing, Speculating, or Dwelling) correlated with self-reported co-rumination scores either. When only the conversation variables from the CRQ (an average of each participant's scores on content areas 5-9 of the CRQ) were correlated with CRCS 1 and 2, only CRQ B significantly positively correlated: $r(21) = .49$, $p = .024$ (CRCS 1), $r(21) = .51$, $p = .019$ (CRCS 2). There were no significant correlations found between CRQ A and CRCS 1, $r(21) = -.01$, $p = .966$, or CRCS 2, $r(21) = .06$, $p = .814$. Participants' CRQ scores were significantly positively correlated with their rumination scores, $r(42) = .31$, $p = .046$, but their CRCS scores were not.

2.4.1.1 Ratings of Happiness and Calmness

Correlations were computed between participants' self-ratings of calmness and happiness and their friends' (other-) ratings of their perceived calmness and happiness for conversations 1 and 2. Correlations showed that when participants were discussing their own problems, their friends were reasonably accurate at assessing how calm and happy they were, but the person discussing their problem was not as accurate at rating their friend's (who was listening to the problem) emotions during the same conversation (see Table 1).

Table 1

Correlations between P1[4] and P2's self-reported scores of happiness and calmness, for themselves and their friends, for conversations 1 and 2.

	Conversation 1			Conversation 2		
	N	*r*	*p*	N	*r*	*p*
P1 own happy* P2 friend happy	21	.57	.008	21	.49	.023
P1 own calm* P2 friend calm	21	.22	.337	21	.48	.027
P1 friend happy * P2 own happy	21	.29	.204	21	-.16	.473
P1 friend calm* P2 own calm	21	.25	.274	21	.18	.448

P1 = participant one; P2 = participant 2; N = number of participants; *r* = correlation co-efficient; *p* = significance.

2.4.2 Gender Differences in Co-rumination

Independent-samples t-tests were conducted to examine gender differences in the five CRCS scores (Rose, 2005) for each conversation, and in CRQ scores.

[4] P1 is the participant who is presenting their problem for discussion; therefore P1 in conversation 1 is a different set of participants than P1 in conversation 2.

Significant gender differences were found for CRQ, Rehashing in conversation 1 and 2, Speculating in conversation 2, Dwelling in conversation 1, and for CRCS 2. However no significant gender differences were found for Encouragement in conversations 1 or 2, Speculating in conversation 1 or Dwelling in conversation 2. There was a tendency towards a significant gender difference for CRCS 1. In all areas females, on average, scored higher than males did for both conversations (see Table 2).

Table 2

Gender differences in self-reported co-rumination (CRQ) and co-rumination coding for each conversation.

	T	*df*	*p*	*Gender*	*M*	*SD*
Co-rumination (CRQ)	3.42	40	.001	M	2.15	0.17
				F	2.98	0.17
Coded Co-rumination 1 (CRCS 1)	1.89	19	.075	M	2.08	0.60
				F	2.71	0.84
Coded Co-rumination 2 (CRCS 2)	2.28	19	.035	M	2.11	0.67
				F	2.79	0.68
Encouragement 1	0.54	19	.596	M	2.56	1.24
				F	2.83	1.11
Encouragement 2	1.02	19	.322	M	2.67	1.22
				F	3.17	1.03
Rehashing 1[5]	2.30	17.82	.034	M	2.22	0.67
				F	3.17	1.03
Rehashing 2	2.54	19	.020	M	2.11	0.78
				F	2.92	0.67

[5] For Rehashing 1, Levine's statistic was significant ($p = .043$) and therefore the degrees of freedom were adjusted.

Speculating 1	0.79	19	.440	M	2.22	0.83
				F	2.58	1.16
Speculating 2	2.85	19	.010	M	1.89	0.60
				F	3.00	1.04
Dwelling 1	2.25	19	.037	M	1.33	0.71
				F	2.25	1.06
Dwelling 2	.74	19	.466	M	1.78	0.83
				F	2.08	1.00

1 = Conversation 1; 2 = Conversation 2; M = Male; F = Female; *t* = T-score; *df* = degrees of freedom; *p* = significance; *M* = Mean; *SD:* = Standard Deviation.

2.4.3 Affect During Problem Discussions

Separate mixed-design analyses of variance of happiness/sadness and calmness/anxiety scores were conducted for each conversation (1 and 2) using 2 (gender; between-subjects) x 2 (person; P1 vs. P2, within-pairs) x 2 (rater; self vs. friend, within-pairs) designs.

The ANOVAs revealed that for happiness and calmness in conversation 1 and happiness in conversation 2 there were significant interactions between person and rater: C1 happiness, F (1, 19) = 7.66, p = .012, η_p^2 = .287; C2 happiness, F (1, 19) = 6.27, p = .022, η_p^2 = .248; C1 calmness, F (1, 19) = 10.54, p = .004, η_p^2 = .357. However the interaction was non-significant for C2 calmness (p = .138). There were no main effects or other significant interactions.

Simple main effects analyses were conducted to decompose these significant interactions. For both conversations, there was a significant difference between own and other ratings for P1, and a significant difference in the opposite direction was found for P2; P1's own ratings of happiness were significantly lower than the score they gave their friend, and P2's own ratings of happiness were significantly higher

than the score they gave their friend. Similarly, in conversation 1, P1's own ratings of calmness were significantly lower than the score they gave their friend, but P2's ratings of calmness were significantly higher than the score they gave their friend. The only instance in which the difference between scores for own and other did not reach significance was for P2's ratings of their own happiness and their friend's happiness for conversation 1, which was very near significance (p = .052; for results see Tables 3 and 4, and Figures 1 and 2).

Table 3

Simple main effects of rater for P1 and P2's happiness in conversations 1 and 2, and calmness ratings for conversation 1 (mixed-design ANOVAs).

		Conversation 1	Conversation 2
Happiness	P1	F (1, 19) = 8.98, p = .007, η_p^2 = .321	F (1, 19) = 5.49, p = .030, η_p^2 = .224
	P2	F (1, 19) = 4.31, p = .052, η_p^2 = .185	F (1, 19) = 4.77, p = .042, η_p^2 = .201
Calmness	P1	F (1, 19) = 6.49, p = .020, η_p^2 = .255	
	P2	F (1, 19) = 9.41, p = .006, η_p^2 = .331	

P1 = Participant 1; P2 = Participant 2

Table 4

Means and Standard deviations of own and friend ratings of happiness and calmness for participants 1 and 2, in conversations 1 and 2.

		Conversation 1		Conversation 2	
		M (SD) Own	*M* (SD) Friend	*M (SD)* Own	*M* (SD) Friend
Happiness	P1	4.48 (0.80)	4.61 (0.76)	4.05 (1.24)	4.53 (0.98)
	P2	4.50 (0.85)	4.16 (1.02)	4.52 (0.89)	4.22 (1.02)
Calmness	P1	4. 89 (1.17)	5.31 (1.03)	4.91 (1.29)	5.25 (1.43)
	P2	5.52 (1.24)	5.13 (1.32)	5.24 (1.26)	5.06 (1.20)

P1 = Participant 1; P2 = Participant 2

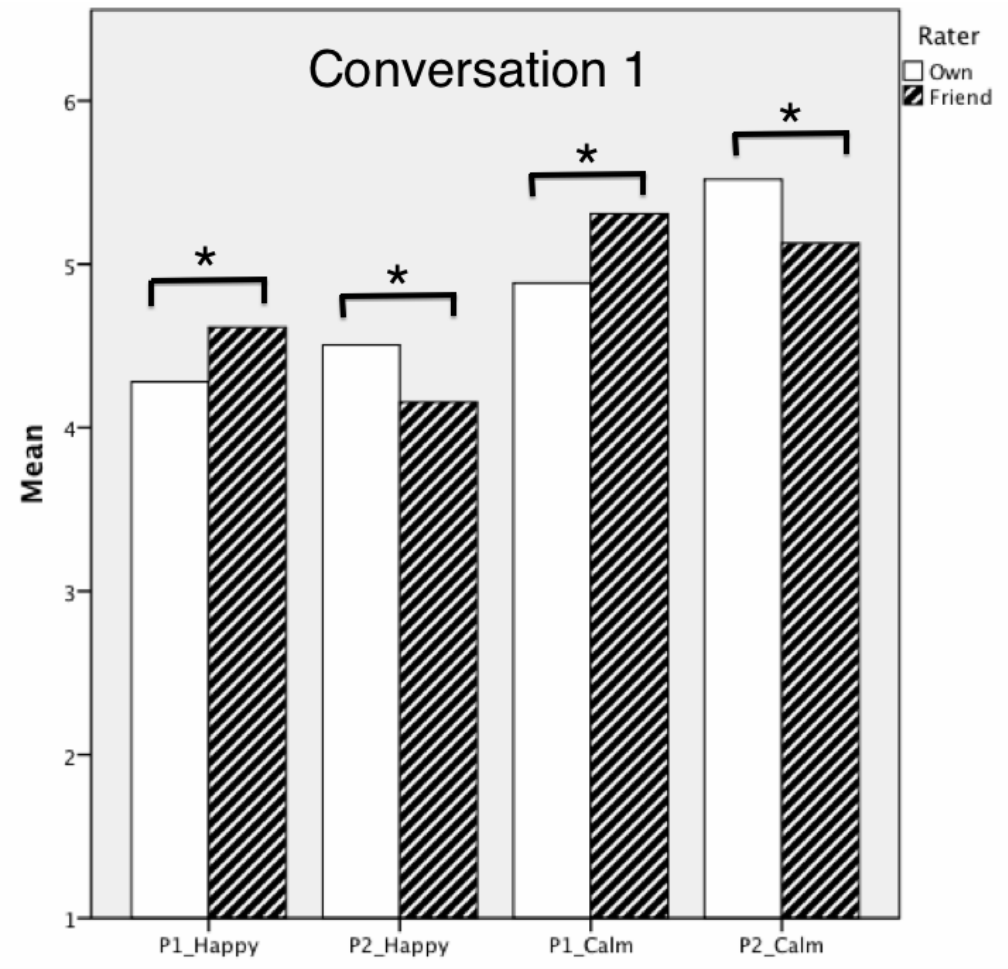


Figure 1: Mean Happiness scores for Participant 1 and Participant 2 (own and friend ratings) for conversation 1.

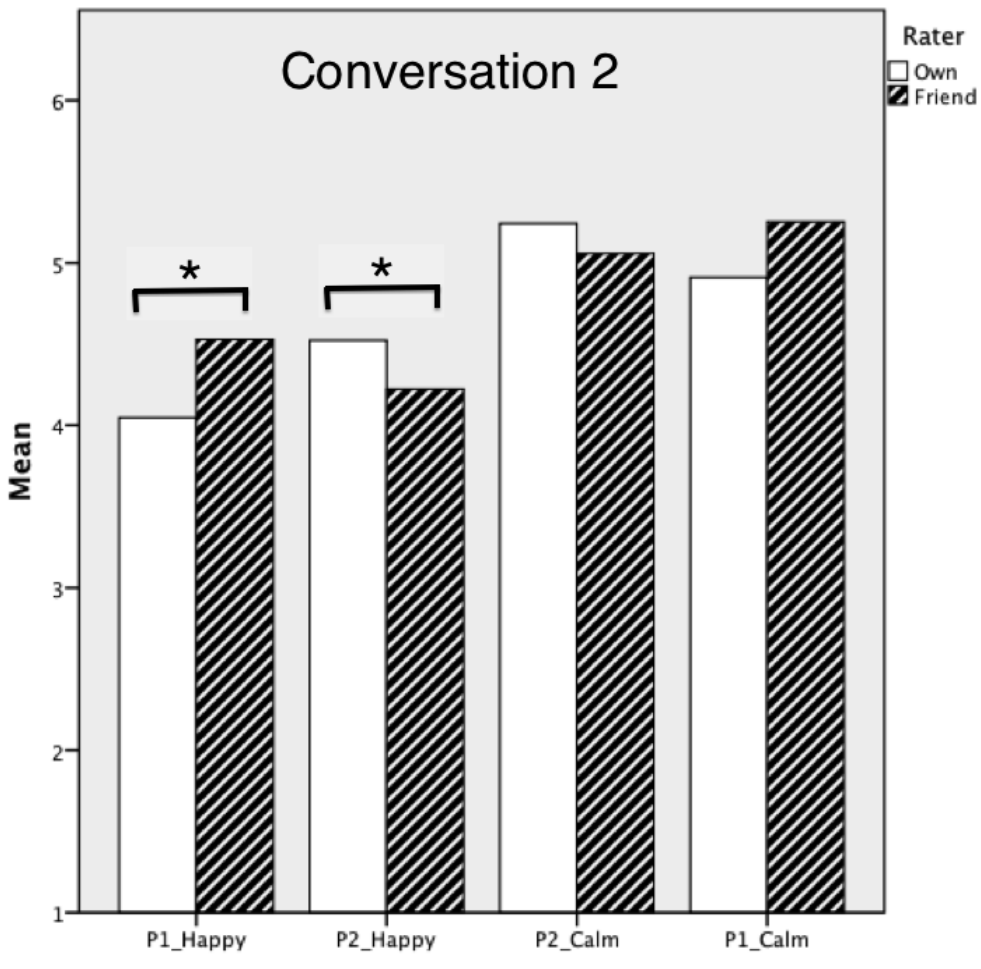


Figure 2: Mean Happiness scores for Participant 1 and Participant 2 (own and friend ratings) for conversation 2.

2.4.4 Self-Reported and Observed Co-rumination

CRCS 1 and 2, and CRQ A and B were added separately as continuous independent variables to the happiness and calmness mixed model ANOVAs.

For happiness, there was a negative main effect of CRCS 1 for conversation 1 and a negative main effect of CRCS 2 for conversation 2: CRCS 1 on conversation 1, F (1, 17) = 13.28, p = .004, η_p^2 = .397; CRCS 2 on conversation 2, F (1, 17) = 4.75, p = .044, η_p^2 = .219. There were no other main effects or significant interactions of interest involving CRCS 1, CRCS 2, CRQ A, or CRQ B.

For calmness, for conversation 1 there was only a significant interaction with CRQ, but not CRCS. For conversation 1 there was a significant interaction between person and CRQ B, F (1, 17) = 13.58, p = .002, η_p^2 = .444. Linear regressions revealed that CRQ B was a significant negative predictor of calmness for P participants (presenting their problem for discussion) in conversation 1 (β = -.62, p = .003), accounting for 39% of the variance. There were no significant effects of CRQ A and there were no significant interactions with calmness for conversation 2. There were no main effects or significant interactions with CRCS 1 or 2 for conversation 1 or 2.

2.4.5 Rumination

The rumination scores of P1 and P2 were added separately as continuous variables to the happiness and anxiety mixed-model ANOVAs for conversations 1 and 2, but there were no significant effects found.

2.5 Discussion

2.5.1 Correlations

Contrary to my prediction, the co-rumination scores (assessed using the CRQ) for friends within a dyad did not significantly correlate but the relationship between them was in the predicted direction (i.e., positive). The lack of significance was surprising as the CRQ had been adapted in this study to make it an assessment of friends' joint co-ruminative style in that particular relationship. This was also assessed with a reduced CRQ (which only assessed 'we' rather than 'I' headed questions in the CRQ), which still produced no significant correlation between friends in the dyad. This would suggest that the participants within a friendship dyad possibly do not have a matching accurate assessment of how they behave within their friendship. This will need to be investigated with a larger sample size to examine if the same finding occurs. The positive relationship however does suggest that there is some comparability with their answers.

As predicted, the co-rumination codings (CRCS 1 and CRCS 2) significantly positively correlated across the two conversations. This suggests that the pair of friends have a co-ruminative discussion style which translates across problem discussions, no matter which friend is presenting their problem for discussion. This is an important finding because the self-reported co-rumination measure (CRQ) is not precise and detailed enough to examine if the participants have different styles of co-rumination, which are dependent on who is presenting their problem for discussion.

Participants found the discussions both natural and similar to discussions they had in private. Therefore we can assume that the coded co-rumination (CRCS) scores are representative of their natural discussion style and not that the two scores correlate

because they had adopted a new artificial discussion style for the purposes of the experiment.

Although I predicted that the coded co-rumination scores (CRCS) for both conversations would correlate significantly with co-rumination (CRQ), this was not found to be the case. However, the non-significant results were positive correlations, which may have reached significance if a larger sample was employed. Further research will need to be conducted with a larger sample size to examine if there is a consistent positive correlation between the two. In addition, I did find some evidence for a positive association between the conversation-specific CRQ (items 5-9 from the amended CRQ) score and the coded co-rumination scores (CRCS) from the conversations. However, unexpectedly these fairly strong correlations were only found between the coding scores (CRCS 1 and 2) and the co-rumination score of the participant presenting their problem for discussion in conversion 2 (CRQ B), but not with the co-rumination score of the participant presenting their problem for discussion in conversation 1 (CRQ A). There is no particular reason that the co-rumination scores of the participants who were presenting their problem for discussion in conversation 2 (CRQ B) correlated, but the co-rumination scores of their friend (CRQ A) did not, it could be the case that there is a more dominant member of a friendship pair that manipulates the level of co-rumination and because of the small sample size in the current study more of these participants were presenting their problem in conversation 2. It could also have been that the person listening to the conversation steered the conversation more in conversation 1 and this led to carryover effects in conversation 2. This will need further investigation in studies with a larger sample size.

2.5.1.1 Co-rumination and Rumination

Co-rumination was found to correlate with rumination, which is in keeping with Rose's (2002) original assumptions that co-rumination is the social manifestation of rumination, and therefore, the two concepts have a related theoretical underpinning. However, as there was no measure of self-disclosure in the current study, the overlap between rumination, co-rumination, and self-disclosure, which was proposed in Rose's (2002) original research, could not be investigated. Therefore, further experimental investigation of the three concepts (rumination, co-rumination, and self-disclosure) is needed to disentangle their mediating effects. However the coded co-rumination (CRCS) and rumination scores did not correlate which suggests that there is some theoretical overlap between self-reported co-rumination and rumination, which is not found in observed co-rumination. The only things which are not really represented in the observed measure, which do occur in the self-report measure, are the frequency of repetition, discussing problems instead of other activities, and possibly the encouragement to keep talking about problems (outside of one particular discussion). Therefore it might be the case that these variables which span across the relationship (rather than just refer to one instance of problem discussion) may be linked with rumination. This would make theoretical sense because one element of rumination is thinking about problems repeatedly, therefore discussing problems repeatedly may be a result of rumination or a contributory factor to rumination. Further investigation will need to be conducted over a longer time frame than the current study to disentangle the effects of self-reported co-rumination (CRQ), coded co-rumination (CCRS), and rumination on affective outcomes.

2.5.2 Gender Differences in Levels of Co-rumination

As has been found with the majority of co-rumination research (e.g., Rose, 2002; Rose et al., 2007), females in the present study co-ruminated more than males, as indexed both by the self-report questionnaire (CRQ) and by the observer's coding of their conversations (this was significant for the coded co-rumination score of conversation 2 [CRCS 2] and nearly significant for conversation 1 [CRCS 1]). When co-rumination was coded from the conversations, gender differences were found for three of the co-rumination facets which contribute to the total co-rumination score; females scored significantly higher on rehashing, speculating (CRCS 2 only), and dwelling (CRCS 1 only), but there were no gender differences for encouragement. A possible reason for the lack of gender differences in encouragement is that all participants may have felt that they had to encourage each other to keep talking about the problem for the duration of the 5-minute conversation in order to follow the experimenter's instructions. Future research should aim to manipulate these areas of co-rumination to examine which specific elements are leading to negative outcomes and whether, if males are encouraged to engage in more co-ruminative behaviour, it can lead to negative outcomes for males as well as females.

2.5.3 Happiness and Calmness Experienced During the Problem Discussions

The analyses of affect experienced during problem discussions show that participants generally rated themselves as less calm and less happy for their own problem discussion than they rated their friend as being during the same conversation. There were some exceptions to this where the results did not reach significance (e.g., no significant difference for calmness ratings in conversation 2), but this may have been

due to small sample size (only 9 male and 12 females pairs), and if the sample were increased then these non-significant results may reach significance.

The results indicated that individuals were more accurate at assessing how their friend felt while their friend was discussing a problem than they were at rating their friend, who was listening to them, in the same conversation[6]. This may be due to the fact that participants thought their friend was less emotionally involved or more emotionally involved than they actually were, or perhaps in some cases individuals who were listening to the problem over-exaggerated or tried to control their emotional expression to make their friend feel more comfortable or empathised with.

2.5.3.1 The Effects of Co-rumination (CRQ and CRCS) and Rumination on Affect.

These basic results do not really tell us anything about the effect of co-rumination during the interactions because there was no manipulation of co-rumination. Therefore self-reported co-rumination (CRQ) and observed coded co-rumination (CRCS) were added separately as continuous independent variables to the happiness and calmness analyses. The results were different for the two co-rumination measures. This was not entirely surprising given that there was no significant correlation between the self-reported co-rumination (CRQ) and either of the coded co-rumination scores (CRCS). The self-reported co-rumination score (CRQ) did not have any meaningful effect on happiness or calmness, whereas the coded co-rumination scores (CRCS) did.

[6] Examination of difference scores between P1's friend ratings of happiness and calmness and P2's own ratings of happiness and calmness demonstrate that around half of the P1 participants were over-estimating their friends' happiness and calmness during the conversation and the other half were under-estimating.

There were main effects of the coded co-rumination scores of conversation 1 (CRCS 1) and conversation 2 (CRCS 2) on happiness (but not calmness); they were both negative predictors of happiness (CRCS 1 in conversation 1, and CRCS 2 in conversation 2), suggesting that the higher the coded level of co-rumination in the conversation, the less happy the participants reported feeling (and were reported by partners as feeling) during the problem discussion. This suggests that the level of co-rumination during the conversation had a large effect on all participants, not just on female participants as I had previously predicted. However it could be the case that the raters who were coding the levels of co-rumination from the videos were using participants' looks of sadness to inform their decision on how much participants were co-ruminating. Although considering the co-rumination score is made up of an average of how much participants were rehashing, speculating, dwelling, and encouraging, it is less likely they were using looks of sadness to inform these coding items than if they had been asked simply to code co-rumination. The fact that the coding may have been affected by facial expressions is something which should be considered and may have affected the results.

The self-reported co-rumination scores (CRQ A and CRQ B) did not have any effect on the levels of happiness but there was one significant interaction between person and the co-rumination score of the person presenting their problem for discussion in conversation 2 (CRQ B); CRQ B was a significant negative predictor of calmness for P participants in conversation 1 (the analyses were run separately for each conversation). There is no obvious reason why this effect should be significant for CRQ B but not CRQ A or for conversation 1 but not conversation 2. However, the results do suggest that the self-reported co-rumination score of the person listening to their friend's problem has a significant effect on their friend's level of calmness. This

is not wholly surprising given that one of the reasons we may discuss problems with others is to gauge their reaction, if the person you are discussing it with is a high co-ruminator this could exacerbate the problem in their friend's mind and make them less calm about the problem. However, I predicted that the levels of co-rumination in the dyad for each member would significantly correlate and this was not the case, therefore this will need further investigation in future studies where the type of problem discussion is more tightly controlled to examine if this has an effect on levels of calmness.

When comparing happiness and calmness for this study with the findings for depression and anxiety from Rose's studies (2002; Rose et al., 2007), there are clear differences in the findings for males and females. The absence of gender differences in the current research is indicative of the presence of negative outcomes of co-rumination for males, which were not found in Rose's research (2002; Rose et al., 2007). However Rose and colleagues (2007) did not report any effect of gender on depression and anxiety in their observational study, which is the one that is most directly comparable to the current research. Further Byrd-Craven et al.'s (2007; 2010) research only used a female sample. Therefore examining gender differences in observational studies is largely uncharted territory which needs further exploration because it is clear that the gender differences, present in correlational self-report studies, may not always be obtained in observational studies.

2.5.4 Methodological Issues and Future Research

The prediction that co-rumination would lead to negative outcomes exclusively for female participants needs to be researched further. As discussed previously, there is only one study (Rose et al., 2005) which can be compared directly to the current

research, and there are no previous studies that have experimentally manipulated co-rumination in order to assess its effects. To clearly examine whether these gender differences do exist it is clear that experiments which manipulate co-rumination and control for other types of problem discussion will need to be conducted.

The methodology of the current research can clearly be improved to investigate the gender differences in the emotional outcomes of co-rumination. The study only really examined the immediate effects of problem discussion and it would be advantageous to look at the results of co-rumination over a longer time-period. It could be the case that in the current research there were no strong gender differences because these gender-dependent effects do not manifest until a longer period of time has passed. The gender differences found in Rose's (2002; Rose et al., 2007) research may be a result of subsequent processes, such as further co-rumination or rumination. To directly compare the findings of this experimental research with Rose et al.'s (2007) 6-month design, a longitudinal follow-up will need to be conducted with a manipulation of co-rumination within the interaction.

A further issue for the current research, which reduces comparability with the previous correlational research, is the use of single-item measures of happiness and calmness. Due to the frequency with which the participants had to rate these dependent variables, for themselves and their friend, during the video-cued recall (15 times each per conversation; a total of 120 times), one-item measures were chosen for their brevity. However, in future research, it might be more valid and practical, since the measures cannot be taken during the conversation in any case, to use a pre-existing, more robust, measure of depression and anxiety at two time-points (before and after the problem discussion). This will allow for both a reduction of possible

fatigue and also direct comparability with previous co-rumination research. In addition to this, it would also be useful to include a measure of self-disclosure and friendship closeness, which would, again, enhance the comparability with previous research and allow the researchers to examine if effects of co-rumination are mediated by friendship closeness.

The age of the sample must also be considered as a factor. It should be noted that the age of the current sample is very different from Rose's (2002) original sample. Rose's participants were aged 8-15 whereas the current sample was aged 18-29. It may be that adolescent girls experience higher levels of anxiety and depression as a result of co-rumination than males do, but, by the time they reach adulthood, this has decreased to match the male experience. Alternatively, it may be that males develop later than girls and do not get involved in the types of social interactions that lead to the same levels of depression and anxiety experienced by girls in their adolescence. However, research has suggested that co-rumination does happen in adulthood (e.g., Byrd-Craven et al., 2010; Haggard et al., 2011) and therefore it is important to examine the emotional effect of co-rumination in adult samples. It is likely, however, that these effects may be reduced, compared with an adolescent sample, because of adults' greater experience of, and probable enhanced coping strategies for, dealing with problems.

2.5.5 Conclusions

The findings of Study 1 suggest that co-rumination may have an effect on males as well as females and that further research should be conducted where there is a larger sample size and where co-rumination is experimentally manipulated. Further, due to the fact that the coded co-rumination levels from the conversation appear to have a

large effect on the happiness levels of the participants during the conversation, but the self-reported co-rumination levels do not, it is clear that this discrepancy needs investigating further using experimental methods.

3 GENDER DIFFERENCES IN AFFECT AS A RESULT OF CO-RUMINATION IN A SIX-MONTH LONGITUDINAL STUDY

3.1 Abstract

The current study aimed to extend the findings of the previous study (Study 1, chapter 2) by examining co-rumination using an experimental design which facilitates co-ruminative discussion. Twenty pairs of male friends and 20 pairs of female friends, aged between 18-30 participated in the current study and were asked to discuss one problem for five minutes. In 50% of trials, the participant who was not presenting their problem for discussion was asked to repeatedly encourage his or her friend to stay focused on discussing the problem. In the remaining trials, participants discussed the problem without additional encouragement to co-ruminate. Self-reported ratings of Positive and Negative Affect (PA and NA; PANAS; Watson et al., 1988) were taken at five time-points: 24 hours before the conversation (T1), immediately before the conversation (T2), immediately after the conversation (T3), two weeks after the conversation (T4), and six months after the conversation (T5). Co-rumination was measured using a questionnaire (amended CRQ) before the conversation and using external coders of the conversation's content (CRCS). Although the experimental manipulation had no significant effects, females did report significantly higher PA and NA at the two-week follow-up whereas males only reported significant increases in NA. At the six-month follow-up the male PA scores had increased to match the females scores, but men were also reporting significantly higher NA than females.

Self-reported and coded co-rumination had different effects; CRQ moderated the effects of time and gender on negative affect while CRCS moderated the effects of time and gender on positive affect. Explanations for discrepancies between the present findings and those of previous research (Rose, 2007; Rose et al., 2007) are discussed.

3.2 Introduction

The current study employed an experimental design which focused on the long-term effects of a specific co-ruminative episode, in order to determine which specific elements of co-rumination lead to depressive symptoms, and whether co-rumination in a specific conversation triggers follow-up processes (e.g., subsequent thinking about and discussing the problem) which further increase negative affect. As there is no experimental research to date that selectively manipulates problem discussions to facilitate aspects of co-rumination, there is no evidence concerning which area of co-rumination is most likely to produce a co-ruminative discussion style. The nine criteria for co-rumination include both conversation-specific behaviours and more relationship-based behaviours. The relationship-based traits are: frequency of discussing problems, discussing problems instead of engaging in other activities, and discussing the same problem repeatedly (Rose, 2002). The conversation-specific traits are: encouragement by the focal … [participant] of the friend's discussing problems, encouragement by the friend of the focal… [participant's] discussing problems, speculation about the causes of problems, speculation of the consequences of problems, speculation about the parts of the problem that are not understood, and focusing on negative feelings (Rose, 2002). The two encouragement criteria could be both conversation-specific and relationship-based and, as they could be very

consistently manipulated, it was decided that the current research should use the 'encouragement' variable as the key factor to manipulate the participants' discussion style to facilitate co-rumination.

Levels of co-rumination during the problem discussion in the current study were assessed using the Co-rumination Coding Scheme (CRCS, Rose et al., 2005) previously used in Study 1. As the coding scheme includes an item assessing 'encouragement', it also permits me to check specifically whether participants in the co-rumination condition were using more encouragement than participants in the control condition.

3.2.1. Observed and Self-reported Co-rumination

Rose et al. (2005) found that the coding scheme (CRCS) had a similar capacity to predict gender differences, increased friendship quality, and increased depression and anxiety to the self-report co-rumination measure (CRQ). However, no previous studies (including Byrd-Craven et al., 2007; 2010) have reported correlations between these two measures, and Study 1 of the present research found no significant association between them, except when CRQ was altered to include only conversation-specific items. As suggested above, Study 1's small sample size reduced the likelihood of obtaining reliable correlations, so the null findings may be a consequence of limited statistical power. Therefore, in the current larger-scale Study I hoped to find that the co-rumination coding scheme (CRCS) positively correlates with the self-report co-rumination measure (CRQ) for both participants involved in the problem discussion.

3.2.2 Co-rumination within Dyads

The previous study (Study 1) found no significant correlation between the self-reported CRQ scores of the pairs of friends. This is particularly surprising as, for the previous study, the CRQ was amended to examine the specific relationship between the two friends taking part in the study, rather than just close friends in general. However, this will need to be re-examined using a larger sample size. Therefore in the current study it is expected that friends' CRQ scores should significantly positively correlate, on the assumption that they both have a similar perception of how they discuss problems within their relationship.

3.2.3 Gender Differences in Co-rumination

Study 1 found gender differences in many of the co-rumination variables (CRQ, rehashing, speculating, dwelling, CRCS 2, and a tendency towards a gender difference for CRCS 1). Females scored higher than males on all of these measures. However, the simple main effects revealed there were no gender differences in reported happiness and anxiety before or after the two problem discussions. Gender also failed to moderate the effects of CRCS and CRQ on reported affect. Rose et al.'s (2007) research suggested that females, but not males, with higher CRQ scores experienced higher levels of depression at a six-month follow up. However, the absence of gender differences in reported happiness and anxiety in Study 1 of this research suggests that co-rumination may have similar emotional outcomes for males and females over the course of a single conversation. However, due to the absence of any comparison between a co-rumination manipulation and a control condition in Study 1, firm conclusions are not yet possible. Therefore in the current study a natural control condition will be used in which the experimenter made no intervention.

Clearly further research, both observational and experimental, is needed to establish whether the gender differences which have occurred in correlational studies (e.g., Rose, 2002; Rose et al., 2007) are consistently found.

3.2.4 Changes in Affect During Problem Discussions

The findings from Study 1 indicated that participants generally perceived themselves as less happy and more anxious than their friend in their own problem discussion, and happier and less anxious in their friend's problem discussion. CRCS negatively predicted happiness across both conversations, this finding suggested that co-rumination is associated with making participants less happy, which supports Rose's (2002; Rose et al., 2007) research, but the study was limited by the fact that it only assessed co-rumination over two conversations and did not examine how this affected participants in the days and weeks after the conversation. Rose and her colleagues (Rose et al., 2007) assessed the effects of co-rumination over a six-month period and for that reason this study will include two follow-ups; one after two weeks and another after six months (for details see below). In this way I would be more able to directly compare the findings of this study with Rose et al.'s (2007) research to examine whether the absence of gender differences in Study 1 was a result of the short duration of the study or whether similar findings would occur in the current study.

Rose et al. (2007) and Hankin et al. (2010) found that the changes in affect over time were predicted by self-reported co-rumination. Hankin et al. (2010) found that base-line co-rumination predicted general internalising symptoms (at 10, 15, and 20 weeks after the problem discussion) and anxious arousal (at 5, 10, 15, and 20 weeks), but not general depressive symptoms. Therefore, in the current sample, I expected that the

CRQ scores before the conversation would be associated with increased depression (decreased PA; in keeping with Rose's research) and increased anxiety (increased NA; in keeping with Hankin's research) after 6-months.

3.2.5 Methodological Issues with Previous Research

The results from Study 1 were encouraging but clearly there were methodological issues which need to be addressed. Although I used the observational measure of co-rumination to examine whether there was a link between co-rumination and affect, it is clearly more rigorous to examine cause and effect using an experimental manipulation. It could have been the case in Study 1 that there were third-variables which were leading to changes in affect, for example just discussing a problem may have led to changes in affect, regardless of co-rumination per se. However the main effects found for CRCS were encouraging. It seems that there is a strong link between CRCS and happiness and that the higher the level of (coded) co-rumination in the conversation the less happy all participants reported feeling, this was found in the previous study in conversations 1 and 2. Obviously this was only tested using the one-item happiness measure and more robust measures (PANAS) will be used to test if CRCS has the same effect in the current study.

Although Rose et al. (2007) examined co-rumination over a six-month period, further research suggested that the negative effects of co-rumination occur soon after the conversation (Byrd-Craven et al., 2010). Therefore I expected the problem discussion in the previous research (Chapter 2) to have an immediate effect. However, as Rose et al. (2007) used a six-month follow-up in their design, for direct comparability, research not only needs to examine co-rumination experimentally, but also needs to assess follow-up processes after co-rumination. The short duration of Study 1 did not

permit assessment of delayed effects, and it may be the case that co-rumination leads to increased negative affect only at some later time-point. Indeed, one reason why it might be considered unlikely that co-rumination immediately increases negative affect, is that any such effect might lead individuals to associate co-rumination with negative affect and consequently desist from engaging in it. However, if any negative effects of co-rumination are delayed, then persistence with co-rumination may be explained by learning about its positive effects on relationship closeness (Rose, 2002; Rose et al., 2007) without registering any downside for affect. Hence, I expect that both male and female participants in the current study will feel closer immediately after discussing their problem. This is based on the positive correlation found between co-rumination and friendship quality, and the positive longitudinal relationship between the two, which has been found in the previous co-rumination literature (Rose et al., 2007). Further, the expected immediate effect on closeness in the current study is also supported by the self-disclosure literature (Rimé, Mesquita, Philippot, & Boca, 1991) which suggests that the person who is presenting their problem will report feeling closer to the listener after they have disclosed their problem to them.

Based on findings from previous longitudinal research (Rose et al., 2007), I also predicted that higher levels of co-rumination would result in increased NA and decreased PA over time, as a result of the individual's self-reported co-ruminative style and as a result of the experimental condition; I expected that those who were in the co-rumination condition would report significantly increased NA and decreased PA than those in the control (No CR) condition. I felt it was important to investigate the different emotional outcomes arising from general problem discussions and from more specific co-ruminative episodes. It is only in this way that we can establish if it is indeed co-rumination having the emotional effects suggested by Rose (2002; Rose

et al., 2007) or whether it is another type of problem discussion, problem discussion in general, or unknown variables.

For the experimental manipulation, co-rumination was facilitated in 50% of trials by asking an individual to discuss a problem they were having (for 5 minutes) while their friend was asked to encourage them to discuss the problem. This was done without the knowledge of the participant whose problem was being discussed so that that the participant would perceive the conversation as natural. I hoped that encouragement of problem talk would trigger a co-ruminative discussion style. The remaining 50% of participants were used as a control, discussing the problem as they naturally would.

The longitudinal nature of the data allowed for assessment and analysis of subsequent thinking about, and discussion of, problems after the experimental manipulation. As co-rumination, as usually operationalized, covers more than a single interaction, it can be assumed that there are processes which occur between co-ruminative interactions which either increase or decrease the likelihood of future interactions. Rose et al.'s (2007) two-point longitudinal design highlighted that there was a reciprocal relationship between co-rumination and internalising symptoms; base-line co-rumination predicted internalising symptoms after six months, and base-line internalising symptoms predicted co-rumination after six months. Hankin et al.'s (2010) multi-wave research also suggested that base-line co-rumination predicted internalising symptoms. Rose et al. (2007) and Hankin et al. (2010) classified internalising symptoms as various forms of depression and anxiety. Accordingly, I predicted that these types of internalising symptoms, more specifically increased depression and anxiety, would occur as a result of co-rumination, and therefore assessed them more directly in the current study. I also felt it necessary to assess how

often the participants were simply thinking about the problem and discussing it with their friend subsequent to the experimental problem discussion. In this way I could examine if co-rumination was reinforced by further discussion of the problem or whether it was reinforced by individuals' thinking about the problem, or through both of these processes.

3.2.6 Aims and Hypotheses

The central aim of the current research was to examine if the findings of previous research (Rose, 2002; Rose et al., 2007) would be supported using a longitudinal experimental design. Co-rumination was facilitated in half of the trials by asking one friend to encourage the other participant to discuss their problem during a five-minute interaction. In the control condition (for the other half of the trials), participants were simply asked to discuss the problem as they naturally would. Participants' positive and negative affect were assessed before the conversation, after the conversation, two weeks after the conversation, and at a six-month follow-up. The adapted, friend-specific CRQ (Rose, 2002; see Study 1 for details) was administered at the beginning of the experiment to assess how much the pairs of friends normally co-ruminated and the problem discussions were assessed for levels of co-rumination using the Co-rumination Coding Scheme (CRCS; Rose, 2005). The following hypotheses were formulated:

1. Participants will encourage each other to discuss the problem more in the CR Condition than in the No CR Condition, thereby facilitating a co-ruminative discussion style. Therefore, participants in the CR condition will experience higher levels of (coded) co-rumination during their problem discussion.

2. Self-reported co-rumination (CRQ) will positively correlate across participants in each pair. Observed co-rumination (CRCS) will correlate with self-reported co-rumination (CRQ). Females will score significantly higher than males on self-reported co-rumination (CRQ), in keeping with previous research (Hankin et al., 2010; Rose, 2002; Rose et al., 2007).
3. Subsequent thinking about and discussing the problem (after the experimental problem discussion) will lead to increased NA and decreased PA after six-months.
4. Both male and female participants will feel closer to their friend immediately after the problem discussion.

3.3 Method

3.3.1 Participants

Participants were 80 students (20 pairs of male friends, and 20 pairs of female friends), aged between 18 and 30 (M = 20.48, SD = 2.79), recruited from Oxford University. The majority of participants were educated to age 18 (95%) and had been friends for six months or more (92%). Eighty-four per cent of participants identified themselves as Caucasian, 14% as Asian or Pacific Islander, and 2% declined to respond. All participants had known the friend who completed the study with them for at least 3 months.

Due to participant attrition, only 72 participants (18 pairs of male friends and 18 pairs of female friends) completed the six-month follow-up questionnaire (T5), so some of the analyses reported below have lower degrees of freedom than others.

3.3.2 Design

Participants provided data at 5 time-points: 24 hours before problem discussion (T1), immediately before problem discussion (T2), immediately after problem discussion (T3), two-weeks after problem discussion (T4) and 6-months after problem discussion (T5). Participants completed a battery of Individual Difference questionnaires at T1 (see below), and these were used as continuous predictors of outcome variables. A repeated measures (within-dyad) factor ('Person') distinguished which of the two participants in the friendship pair was presenting their problem for discussion ('problem participant' [P participant] vs. 'Not-problem participant' [NP participant]). Equal numbers of male and female pairs were allocated to the two conditions (CR: mutual encouragement of problem talk vs. No CR: control), and hence gender and CR condition were used as between-subjects factors. The main dependent variables were reports of affect at T1, T2, T3, T4, and T5. The study used a 2 (time; within-subjects) x 2 (person; within-pairs) x 2 (gender; between-subjects) x 2 (CR condition; between-subject) factorial mixed design.

3.3.3 Measures[7]

Demographics. Participants were asked to indicate their gender, age, education level, and ethnicity.

[7] The measures listed below were taken from a larger sample of questionnaire items. Measures which are not relevant to the current study will not be discussed. For a full version of the original questionnaire please see Appendix 4 and for a summary of the measures at each time point please see Appendix 9.

Friendship. Participants were asked how well they knew the friend they were participating with on a 7-point Likert scale running from 1 (hardly at all) to 7 (very well). Participants were also asked to indicate how long they had known each other (in months and years).

Co-Rumination (CRQ; Rose, 2002). The adapted relationship-specific version of the 27-item co-rumination questionnaire (for the current sample, Cronbach's α = .97) assessed participants' tendency to co-ruminate when discussing problems with the friend they were participating in the study with (please refer to chapter 2, for further details and to Appendix 1 for the full measure).

Co-rumination Coding System (CRCS; Rose et al., 2005). As in Study 1, Rose et al.'s (2005) coding system was used to code the videos for the conversation from each pair of participants (see Study 1 for details). As well as providing an alternative measure of co-rumination for use as a continuous predictor, this measure served as a manipulation check for the co-rumination manipulation. The first coder coded the full set of 40 videos and the second coder coded roughly half (n = 21) of the total videos. Pearson correlations were computed to examine inter-coder reliability on the 4-coding-areas (Encouragement, Rehashing, Speculating, and Dwelling). The two coders' ratings showed statistically reliable correlations for Encouragement, $r(21)$ = .61, p = .003, Rehashing, $r(21)$ = .47, p = .033, and Dwelling, $r(21)$ = .60, p = .004, but not for Speculating, $r(21)$ = .23, p = .320. The average of the four coding areas (Encouragement, Rehashing, Speculating, and Dwelling), in keeping with Rose et al.'s (2005) original coding, was calculated to give the overall co-rumination score (Coded Co-rumination Score; CRCS). Pearson Correlations showed that both raters' coded CRCS scores correlated positively, $r(21)$ = .60, p = .004.

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). The 22-item RRS was used to measure participants' tendency to ruminate. For the current sample the measure had good internal reliability (Cronbach's α = .90; please refer to chapter 2 for further details).

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). The 20-item PANAS assessed participants' levels of positive and negative affect. Ten items were used to assess positive affect (PA); example items are 'interested' and 'alert' (in the current sample Cronbach's α for all time points were above .70). Another ten items were used to assess negative affect (NA); example items are 'distressed' and 'guilty' (in the current sample all Cronbach's α were above .70). Participants were asked to indicate how they were currently feeling at all time-points (immediate-PANAS; T2, T3, T4, & T5). At T1 only, they also completed the original form of the PANAS indicating how they had been feeling in the past two weeks (2-week-PANAS). In all cases, participants rated each of the 20-items on a 5-point Likert scale from 1 (very slightly or not at all) to 5 (extremely).

Closeness. Participants rated 'How close do you feel to your friend' on a 7-point Likert scale (1, not close at all, to 7, very close) at T1, T2, T3, T4, and T5.

Problem Selection. Participants rated how important their problem was on a 7-point Likert scale (from 1, to a maximum of 7) at T3. The average importance score (of the problems which were selected for discussion) indicates that participants perceived their problems to be important to them (M = 5.10, SD = 1.28).

Realism of the Conversation. After the problem conversation participants were asked to indicate how similar they found the conversation to conversations they had

with their friend in private and how natural they found the conversation. Participants responded to both questions on a 7-point Likert scale from 1 (not at all) to 7 (very).

Problem Coding (Landoll et al., 2011). After the problem conversation, the problems that the participants had discussed were coded into two types: interpersonal and non-interpersonal.

- Interpersonal: Problems to do with people (e.g., peers, romantic, family, or partners).
- Non-interpersonal: Problems not to do with people (academic, employment-related)

Two coders coded the full sample of 40 problem discussions, the two coders' ratings showed statistically reliable correlations, $r(40) = .78$, $p < .001$. There were 24 interpersonal and 16 non-interpersonal problems reported.[8]

Subsequent Thinking About and Discussing Problems. Participants were asked two questions to assess to what extent they had been thinking about or discussing the problem subsequent to discussing the problem in the lab: (1) 'How often have you thought about the problem (which you discussed with your friend in the lab) over the past two weeks when you have been by yourself?'; and (2) 'How often have you discussed the same problem with the same friend over the past two weeks?'. Participants responded to both questions on a 7-point scale (from 1, not at all, to 7).

Problem Resolution. Participants were asked to report at the six-month follow-up whether the problem was ongoing (yes/no response). However, due to insufficient

[8] There were no significant results of interest for this problem coding in this study or in the following study, therefore this measure will not be discussed further in this thesis.

cell sizes (88% of problems were resolved), this data was not analysed and will not be discussed further.

3.3.4 Procedure

At T1, participants completed the online questionnaires, (including demographic information, RRS, CRQ, and the 2-week-PANAS) at home. When both participants (of each pair) had completed the T1 questionnaire, they were invited into the laboratory. In the laboratory, participants first individually completed the immediate-PANAS online (T2). Participants were then asked to complete the problem selection where they were each asked to separately describe three problems they had discussed with their friend in the past three months and put them in order of importance. Once this was complete, one member of the pair was selected at random to discuss their problem; their most important problem (of the three that participant had written down; which they were comfortable discussing) was selected for discussion. Problems ranged from minor work problems to very serious problem such as death of a parent. Once the problem had been selected, participants were asked to discuss it for around 5 minutes; in 50% of trials, the participant who was not presenting a problem for discussion [NP participant] was asked to 'continually encourage... [their] friend' (P participant) to discuss the problem for the 5 minutes (CR condition), and in the remaining 50% of trials no intervention was made by the experimenter (No CR condition). After the problem discussion (T3), participants completed another questionnaire in the lab, including the immediate-PANAS and ratings of closeness, importance of the problem, and how natural and similar the discussion was to problem discussions they have in private. Two weeks after the laboratory session (on average 15 days after; T4), participants completed a follow-up online questionnaire,

which included the immediate-PANAS, closeness and importance ratings, and the subsequent thinking about and discussing the problem measures. The final follow-up questionnaire (T5) was distributed online, six months after (on average 177 days after) the laboratory session. The questionnaire included the immediate-PANAS, closeness, and the subsequent thinking about and discussing the problem measures.

3.4 Results

3.4.1 Manipulation Checks

Manipulation checks to examine if co-rumination had been facilitated in the CR condition were conducted using scores from the Co-rumination Coding Scheme (CRCS). A two-way ANOVA was conducted to examine the effects of gender and CR Condition on CRCS scores (an average of the scores for Encouragement, Speculation, Dwelling, and Rehashing). There was no significant difference between the CRCS scores for the two conditions, F (1, 36) = .15, p = .705, η_p^2 = .004. There was a main effect of gender, F (1, 36) = 8.22, p = .007, η_p^2 = .186; females (M = 2.90, SD = 0.38) scored significantly higher than males (M = 2.53, SD = 0.45) on CRCS. However there was no significant interaction between CR Condition and gender, F (1, 36) = .58, p = .450, η_p^2 = .016.

NP participants were asked to encourage their friend to talk about the problem as a way of facilitating a co-ruminative discussion style; therefore the Encouragement item from the co-rumination coding scheme was used as a manipulation check to see if there were any differences by gender or CR Condition. Again, there was a main effect of gender, F (1, 36) = 5.43, p = .025, η_p^2 = .106; females (M = 2.95, SD = 0.76) scored significantly higher than males (M = 2.50, SD = 0.61) on Encouragement. However, again, there was no main effect of CR Condition and no significant

interaction between CR Condition and gender. There were also no effects of gender or condition on any of the other co-rumination coding items (Rehashing, Speculating, or Dwelling).

3.4.2 Naturalism Checks

After the problem discussion, participants were asked to rate how natural the conversation felt (M = 4.05, SD = 1.44), and how similar the conversation was (M = 5.06, SD = 1.37) to conversations they have in private. Participants' scores for naturalism and similarity significantly correlated, $r(80) = .71$, $p < .001$; therefore the two scores were aggregated into one 'realism' scale (M = 4.56, SD = 1.29).

Two-way ANOVAs were used to examine if there were any significant differences in rated realism between genders, CR Conditions, or persons (at T3). There were no significant effects involving gender or person; however, there was a significant main effect of CR Condition, F (1, 78) = 5.58, p = .021, η_p^2 = .067; participants in the CR condition reported the conversation as significantly more 'real' (M = 4.89, SD = 1.04) than those in the No CR Condition (M = 4.23, SD =1.44).

3.4.3 Correlations

Using the full data set of 80 participants, correlations between CRQ, 2-week-PANAS, RRS and closeness were analysed (all measures taken at T1). Co-rumination (CRQ) significantly positively correlated with how close participants felt to their friend, $r(80) = .44$, $p < .001$. There were no significant correlations between co-rumination and rumination, positive affect, or negative affect. However, rumination correlated negatively with positive affect, $r(78) = -.47$, $p < .001$, and positively with negative affect, $r(78) = .35$, $p < .005$.

3.4.4 Co-rumination

3.4.4.1 Coding Checks

Pearson's correlation coefficients were calculated to examine if P participants' CRQ scores correlated with NP participants' CRQ scores; there was a significant positive correlation, $r(40) = .34$, $p = .033$. Pearson's correlation coefficients were also calculated to examine if CRCS scores were associated with participants' (P and NP) self-reported CRQ (taken at T1). The P participants' CRQ scores did significantly correlate with the CRCS scores, $r(40) = .38$, $p = .020$, whereas the scores did not significantly correlate for NP participants, although the relationship was positive, $r(40) = .15$, $p = .36$. This was checked with the conversation variables from the CRQ (items 5-9; see Study 1 for details), but neither CRQ P or NP correlated with CRCS.

3.4.4.2 Gender Differences

An independent-samples t-test revealed that there was a significant gender difference between the male and female CRQ scores, $t(77) = 4.04$, $p < .001$; women ($M = 2.75$, $SD = 0.89$) scored significantly higher than men ($M = 2.08$, $SD = 0.62$), matching the earlier finding for CRCS. No significant gender difference was found for rumination.

3.4.5 Difference Scores

At T2 (before the experimental manipulation), an independent-samples t-test revealed that PA scores for the two co-rumination conditions (CR and No CR) were significantly different, $t(82) = 2.80$, $p = .006$. To correct for this manipulation-independent effect, T2 PA scores were subtracted from PA scores at T3, T4, and T5 to produce difference scores. Similar difference scores were also calculated for NA to maintain a consistent analytic approach across these dependent variables.

3.4.6 Positive and Negative Affect at T3 and T4

3.4.7.1 T3 and T4 (Immediately and Two-weeks After the Problem Discussion)

A mixed-design ANOVA of PA difference scores at T3 and T4 was conducted; including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and CR condition as between-subjects factors. A corresponding mixed-design ANOVA was also conducted on NA scores (using difference scores to enhance comparability with the difference scores calculated for PA; for means and standard deviations see Table 5).[9]

Table 5

Gender differences in Mean PA and NA (Difference Scores) immediately after the interaction (T3), two weeks after the interaction (T4), and six months after the interaction (T5).

		T3		T4		T5	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
PA	**Male**	0.40	4.38	-1.43	4.88	2.06	4.07
	Female	-0.45	2.00	2.30	6.37	2.78	5.17
NA	**Male**	0.65	5.91	2.58	3.49	5.56	4.56
	Female	-1.05	4.37	0.83	3.18	2.69	3.40

PA = Positive Affect; NA = Negative Affect

[9] T5 was excluded from these analyses because using the full dataset (T3 & T4) increased the statistical power.

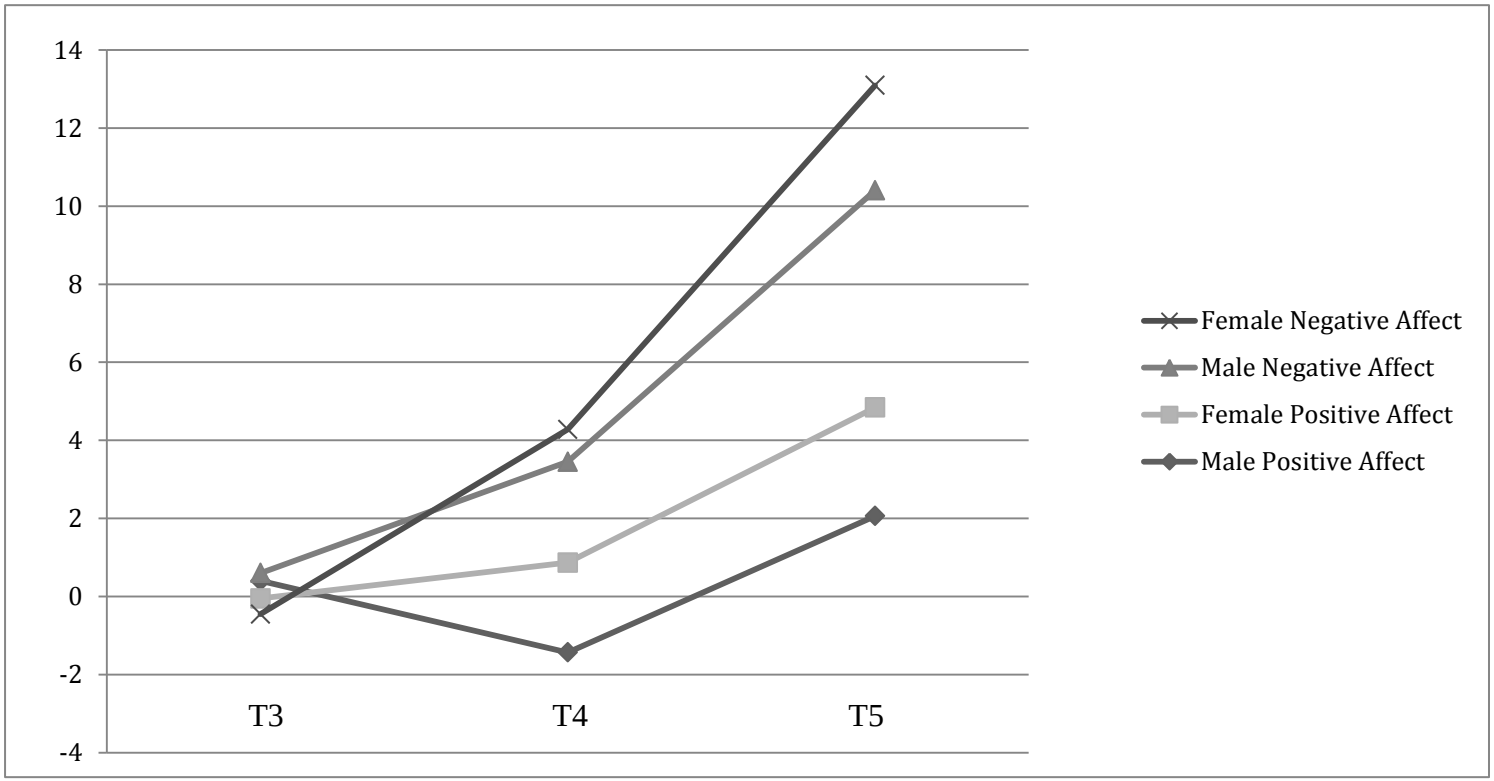


Figure 3: Mean positive and negative affect scores for males and females immediately after the experimental interaction (T3), two weeks after the experimental interaction (T4), and six months after the experimental interaction (T5).

None of the factors had a significant main effect on PA. There was a significant interaction between time and gender, F (1, 36) = 5.95, p = .020, η_p^2 = .142. There was a significant difference between the PA difference scores of females at T3 and T4, F (1, 36) = 4.30, p = .045, η_p^2 = .107; females scored significantly higher on PA at T4 (M = 2.30, SD = 6.37) than at T3 (M = -0.45, SD = 2.00). However, there was no significant effect of time on male PA. Comparing the genders at each time point, there was a significant difference between the PA scores for males and females at T4, F (1, 36) = 4.18, p = .048, η_p^2 = .104, females scored significantly higher on PA (M = 2.30, SD = 6.37) than males did (M = -1.43, SD = 4.88), but there were no significant gender differences at T3.

For NA, there was a significant main effect of time, F (1, 36) = 13.65, p = .001, η_p^2 = .275. Participants scored significantly higher on NA at T4 (M = 1.70, SD = 3.41) than at T3 (M = -0.10, SD = 5.20). None of the other factors had a main effect on NA and there were no significant interactions.

3.4.6.2 Effects of Co-rumination and Co-rumination Coding on Affect at T3 and T4

When CRQ NP was added to the PA and the NA analyses (separately) as a continuous independent variable, there was no main effect or significant interactions with any of the other variables. When CRQ P was added to the PA analysis, there was no main effect but there was a significant interaction between time and CRQ P, F (1, 32) = 8.80, p = .006, η_p^2 = .216. Although linear regressions to analyse the predictive ability of CRQ P at T3 and T4 were both non-significant, at T3 there was a positive relationship between CRQ P and PA and at T4 there was a negative relationship between CRQ P and PA. When CRQ P was added to the NA analysis, there was a

significant three-way interaction between time, gender, and CRQ P, F (1, 32) = 4.46, p = .043, η_p^2 = .122. CRQ P was a significant positive predictor of NA at T4 for females (β = .52, p = .018), accounting for 27% of the variance, but not for either males or females at T3, or for males at T4.

When CRCS was added as a continuous independent variable to the PA analysis, there was a significant interaction between time, gender, and CRCS, F (1, 32) = 5.81, p = .022, η_p^2 = .154. Linear Regressions revealed that CRCS was a significant negative predictor of the difference scores for PA at T4 for females (β = -.49, p = .030), accounting for 24% of the variance, but not at T3, or for males at either time-point. When the CRCS score was added as a continuous independent variable to the NA analysis there was no main effect or significant interactions.

3.4.6.3 T5 (Six-months After the Problem Discussion)

The T5 data were added to the mixed design ANOVAs for PA and NA (previously including only T3 and T4), creating a 3 (time) x 2 (gender) x 2 (condition) x 2 (person) interaction (using the reduced data set of 36 pairs of participants). However no further significant results of interest were found. Therefore, due to the reduced sample size, the T5 data were analysed separately (using mixed-design ANOVAs); the results are presented below.

A 2 (gender) x 2 (condition) x 2 (person) mixed-design ANOVA of PA scores revealed no significant results of interest when the T5 data was analysed in isolation. A matching mixed-design ANOVA of NA scores revealed a significant main effect of gender, F (1, 32) = 4.58, p = .040, η_p^2 = .125; males reported significantly higher NA (M = 5.56, SD = 4.56) than females (M = 2.69, SD = 3.40) at T5. There was also a

significant interaction between person and gender, F (1, 32) = 5.22, p = .029, η_p^2 = .146; P-males reported significantly higher levels of NA (M = 8.11, SD = 7.69) than NP-males (M = 3.00, SD = 3.71), F (1, 32) = 7.72, p = .009, η_p^2 = .194. However the NA scores of P-females (M = 2.28, SD = 4.38) and NP-females (M = 3.11, SD = 5.55) did not differ significantly, F (1, 32) = 7.44, p = .010, η_p^2 = .189. There were no significant differences between NA scores of males (P and NP) and NP females.

3.4.6.4 Self-reported and Observed Co-rumination Coding at T5

When CRQ NP and CRQ P were added separately as continuous independent variables to the NA analysis, there was a significant interaction between gender and CRQ NP, F (1, 28) = 4.96, p = .034, η_p^2 = .150. Linear regressions revealed that CRQ NP was a positive predictor of male NA at T5 (β = .52, p = .026), accounting for 27% of the variance, but not of female NA. There were no effects found when CRQ NP and CRQ P were added to the PA analysis.

When the CRCS score was added as a continuous independent variable in the T5 PA analysis, there was again a significant interaction between gender and CRCS, F (1, 28) = 5.57, p = .026, η_p^2 = .166. Linear regressions revealed that CRCS was a significant negative predictor of PA for females at T5 (β = -.50, p = .037), accounting for 25% of the variance, but not for males. When the CRCS score was added as a continuous independent variable to the NA analysis there was no main effect of CRCS or interactions with CRCS.

3.4.7 Rumination

When Rumination was added as a continuous independent variable to the PA and NA mixed model ANOVAs for T3 and T4, and separately for T5, no significant results of interest were found.

3.4.8 Closeness

Participants generally scored high on closeness at T1 (M = 5.49, SD = 1.19); 25% of participants scored the maximum (7) and over 75% scored above 5. No participants rated their closeness to their friend below 3. P and NP participants' closeness scores significantly positively correlated at T1, $r(40) = .57$, $p < .001$.

A mixed-design ANOVA of closeness scores at T2, T3, and T4 was conducted. There were no main effects of, or interactions with, time, but there was a significant interaction between person and CR Condition, F (1, 36) = 4.20, p = .048, η_p^2 = .104; P participants scored significantly higher on closeness (M = 5.83, SD = 0.95) than NP participants (M = 5.48, SD = 0.82) in the No CR condition, but there was no significant difference between P and NP participants in the CR condition. When T5 was added to the same analysis (using the reduced data set), there were no further results of interest.

When the CRCS score was added as a continuous independent variable to the closeness analysis there was a significant interaction between CR Condition and CRCS, F (1, 28) = 5.87, p = .022, η_p^2 = .173. Linear regressions revealed that CRCS was a significant positive predictor of closeness in the No CR condition (β = .62, p = .006), accounting for 39% of the variance, but not in the CR condition. There were no other significant effects involving CRCS. The same analysis was conducted with CR

P and CR NP as continuous independent variables, but no additional significant effects were found.

3.4.9 Subsequent Thinking About and Talking About the Problem

A mixed design ANOVA of scores assessing how often participants had thought about the problem at T4 and T5 was conducted (using the reduced data-set) including time (within-pairs) and person (within-pairs) as repeated measures factors and gender and CR condition as between-pairs factors. Unsurprisingly, there was a main effect of person, F (1, 33) = 16.58, $p < .001$, $\eta_p^2 = .334$; P participants thought about the problem more (M = 3.94, SD = 1.50) than NP participants did (M = 3.11, SD = 1.03). There were no significant main or interaction effects. When the same analysis was conducted to analyse how often the person has discussed the problem (rather than thought about the problem) there were also no significant main or interaction effects. When CRCS and CRQ (P and NP) were added separately to the thinking and discussing mixed design ANOVAs there were no significant results of interest.

3.5 Discussion

3.5.1 Experimental Manipulation

Manipulation checks indicated that there was no significant difference between the coded co-rumination score (CRCS) for the two conditions (co-rumination [CR] and no co-rumination [No CR]); this suggests that the experimental manipulation did not result in significantly more co-rumination in the co-rumination condition than in the no co-rumination condition. There was also no significant difference between conditions in any of the co-rumination dimensions (taken from the co-rumination coding scheme). There was an effect of gender on Encouragement, showing that

females encouraged their friends to talk about the problem more than males did; this may be due to the fact that females co-ruminated more (women scored significantly higher on coded co-rumination [CRCS]) or that this is a more natural style for women rather than men. As we had asked participants in the co-rumination condition to encourage their friend to talk about the problem, we expected there to be a main effect of condition (significantly higher encouragement in the co-rumination condition). However, it may be that our codings were not sensitive enough to detect genuine effects of the manipulation. Indeed it is clear that the manipulation did make a difference to other dependent variables. For example, there was a significant difference between conditions in reported realism of the conversation; participants in the co-rumination condition rated the conversation as significantly more real (natural and similar to their usual conversations) than those in the control condition; this may be due to the fact that participants who were in the co-rumination condition found that it was easy for the conversation to continue for the allotted time because one participant had been given the task of driving the conversation forward (encouragement). By contrast, participants in the control condition may have found it less natural as they may have been unsure how to fill the time once they felt that they had finished discussing the problem. Therefore, the encouragement manipulation did make a difference to the conversations, but it is not clear that its effects were exactly the ones that were intended.

The experimental manipulation may not have worked as intended for a number of reasons. It is possible that the instructions were not clear or specific enough to have their intended effects. For example, because participants knew they would be discussing the problem for five minutes, they may have encouraged each other to

discuss the problem to keep the conversation going for the required time in both conditions, leading to no difference between them in levels of encouragement.

In future studies, it would be better for the experimenter to focus on the negative nature of co-rumination (negative affect, negative causes, and negative consequences), rather than encouragement, as this may be less likely to occur naturally and, as it is a large part of co-rumination, may be more likely to facilitate co-rumination. 'Encouragement' during the conversation could be to try and solve the problem, or to focus on the positive aspects, whereas discussing the problem negatively would be more exclusively co-ruminative. Previous research has found that dwelling on negative affect led to increased internalising symptoms for women (Byrd-Craven et al., 2007) and it is sensible to assume, from the rumination literature (Nolen-Hoeksema, 1987; Nolen-Hoeksema, 2002; Nolen-Hoeksema & Morrow, 1991), that focusing on negative affect will lead to greater internalising symptoms such as anxiety and depression. However, there are obvious ethical difficulties with asking participants to only focus on the negative aspects, which would need to be considered and overcome.

It is interesting to note that the gender differences found for the co-rumination coding items for the current study are different from the gender effects found for Study 1 (Chapter 2). In the current study, females scored significantly higher than males on encouragement and overall coded co-rumination (CRCS), whereas for the previous study females scored higher than males on all variables (Speculating, Dwelling, Rehashing, and coded co-rumination [CRCS]) apart from encouragement. It is encouraging that the finding for the gender difference on coded co-rumination (CRCS) remains stable but future studies will need to analyse the gender differences

between the coding items further and examine to what extent each of the elements plays a part in co-rumination's negative outcomes.

3.5.2 Co-rumination (Relationship between CRQ and CRCS)

self-reported co-rumination (CRQ) and coded co-rumination (CRCS) scores significantly correlated for participants who were presenting their problem for discussion, but not for their friends who were listening to the problem (there was a non-significant positive relationship). Although self-reported co-rumination scores (CRQ) for the two participants in each pair significantly correlated, the results suggest that it might be the person who is presenting their problem who drives the level of co-rumination that takes place in a particular problem discussion. This is contrary to what was found in the previous study (Chapter 2), where there was no significant correlation between the two participants' self-reported scores, and also no significant correlation between participants' self-reported co-rumination scores and observed co-rumination scores. The difference may be due to the larger sample in the current study, or due to the fact that only one problem was discussed by each pair in the current study therefore the person presenting the problem could have been more of a driving force in the discussion. In the previous study, when the conversation-specific co-rumination (CRQ) was examined, only the CRQ B score (participants who were presenting their problem for discussion in conversation 2) significantly positively correlated with the CRCS scores for conversations 1 and 2, whereas for the current study there were no correlations between the conversation-specific co-rumination (CRQ) and coded co-rumination (CRCS) scores. The difference could be due to the fact that the participants knew they were only having one conversation in the current study, or due to a change as a result of the manipulation which was not picked up by

the 'encouragement' variable from the coded co-rumination score (CRCS). The change may have been too subtle to be coded but nevertheless may have had an effect on the results. For example, in the current study the listener may not have taken a primary role in driving the conversation because they were concentrating on encouraging their friend to talk rather than taking an active role in the conversation, and the coded co-rumination score (CRCS) would not have been sensitive enough to pick up the distinction.

3.5.2.1 Gender Differences

In keeping with existing research (Hankin et al., 2010; Jose et al., 2012; Rose, 2002; Rose et al., 2007; Tompkins et al., 2011) and the findings of Study 1, females scored significantly higher on CRQ than males did. This finding was also supported by the fact that females scored higher on coded co-rumination (CRCS) than males (as they also did in one of the two conversations in Study 1). This suggests that both self-reported and observed co-rumination scores are significantly higher for females than males.

3.5.2.2 Co-rumination, Rumination, Closeness, and Affect

Significant correlations were found between co-rumination and closeness, supporting Rose's (2002) initial hypothesis that co-rumination makes people feel closer to their friend. However, co-rumination did not significantly correlate with rumination. Due to the fact that Rose (2002) suggested that co-rumination bridged the concepts of self-disclosure and rumination, I expected to see a significant positive correlation between co-rumination and rumination, as was found in Study 1. However rumination did correlate positively with negative affect, and negatively with positive affect,

suggesting that there is a relationship between rumination and the negative affective outcomes that we expect from co-rumination.

3.5.3 Positive and Negative Affect

It was hypothesised that there would be no immediate change in affect after the problem discussion. From the means of the participants' positive affect (PA) and negative affect (NA) difference scores it is clear that, compared with their score before the problem discussion, there is very little change in the difference scores for affect (please refer to table 2 above)[10]. Females reported slightly lower PA and NA difference scores (compared with before the problem discussion) and males reported slightly higher PA and NA difference scores immediately after the conversation.

Two weeks after the problem discussion, females (P and NP participants) scored significantly higher on positive affect and negative affect than they did immediately after the problem discussion. Although the differences scores indicated that males also experienced an increase in NA they did not mirror the female findings for PA; the male PA scores after two-weeks were not significantly different from their scores immediately after the conversation (there was a slight decrease in PA but it was non-significant). The differences scores indicated that males scored significantly lower than females on positive affect two weeks after the problem discussion, reflecting the fact that the increase in PA experienced by female participants was not found for male participants. At the six-month follow up, males' average PA had increased to match the female level (which remained stable from two-weeks to six months) and, although T5 was examined in isolation, it is clear from the means that there is a large increase

[10] This was checked with the original PA and NA scores at T2 and T3 (before the difference scores were calculated), and there were no significant main effects of time (p = .963 and p = .809, respectively).

in negative affect for males at the six-month follow up and a slight increase for females; the results confirm that males were scoring significantly higher than females on negative affect at the six-month follow up.

The matching increase in negative affect (NA) for males and females, but the increase of PA only for females, could be a potential reason why men engage in co-rumination less than women; if women experience increases in both positive and negative affect after co-ruminating, this may encourage them to co-ruminate more than their male counterparts, who only experience increases in negative affect. However, it must be emphasized that we can only speculate that this may be the case, because there was no effect of co-rumination condition, and we did not include a no-problem-discussion control condition, so we do not know whether the findings were a result of co-rumination, problem discussion, or third variables. However I did examine self-reported and observed co-rumination as continuous independent variables and found that they did have at least some effect on experienced affect (see section 3.5.4).

When examining the simple main effects there were also no main effects of person or condition or significant interactions involving these variables in the T3/T4 analysis, and for T5 there was only one interaction between person and gender; males presenting their problems for discussion (P males) scored significantly higher on negative affect than males who were listening to their friends' problems (NP males), but P and NP females did not differ in NA. Although we might expect that the negative affect would be higher for the participant who has presented their problem for discussion, there is no obvious reason why this effect was found for males but not for females. The significant main effect of gender showing that males scored higher on NA than females at T5 (at the 6-month follow up) is also surprising, given that

previous co-rumination research (Rose et al., 2007) leads us to expect that females should experience higher negative affect. It is unlikely to be due to the experimental interaction but it could have been the case that simply completing the six-month follow-up, and being reminded of the problem they had discussed, made males feel worse. However this cannot be confirmed in the current study and this could have also been due to unknown extraneous variables in this sample.

3.5.4 Co-rumination and Affect

CRCS was a significant negative predictor of PA difference scores for females at T4 (the two-week follow up) and T5 (the six-month follow-up; at T4, CR P was also a negative predictor of PA but the finding did not reach significance). This negative relationship supports the findings of previous co-rumination research which suggests that co-rumination leads to increased depression and anxiety[11] (Byrd-Craven et al., 2010; Hankin et al., 2010; Rose et al., 2007; i.e., in this study lower PA and higher NA). However, as there is no existing observational research which reports the change in affect in the weeks following an interaction, or any experimental research into co-rumination, these results must be analysed further in an experimental study which (successfully) manipulates co-rumination. The results for negative affect must also be taken into account. For females, not only is there a significant increase in PA (difference scores) at T4 (compared with T3; immediately after the conversation), but also for participants in general, there is a significant increase in NA at T4 (two weeks after the conversation).

[11] Watson et al. (1988) indicated that there was a significant negative relationship between the positive affect score and self-reported levels of depression, and also a significant positive relationship between the negative affect score and self-reported levels of anxiety.

The finding for negative affect (participants experience significantly higher NA two weeks after the conversation than six months after the conversation) can also be explained by co-rumination; however in this instance self-reported co-rumination (CRQ) has an effect, rather than coded co-rumination (CRCS), as was the case with positive affect. The co-rumination score of the person presenting their problem for discussion (CRQ P) was found to be a positive predictor of NA for females two weeks after the conversation (at T4). This suggests that the increase in negative affect difference scores that females experience two weeks after the problem discussion is influenced by the (self-reported) co-rumination score of the person presenting their problem for discussion (CR P). This is interesting because it may suggest that the co-rumination scores of female participants, who later go on to discuss their problems, have predictive power over not only their own levels of negative affect, but also their friend's levels of affect two weeks after the conversation (at T4). Further, it should be noted that this female-only finding supports Rose's (2002; Rose et al., 2007) suggestion that co-rumination only has negative outcomes for females. The matching level of male negative affect two weeks after the interaction (at T4) is not influenced by either observed co-rumination (CRCS) or self-reported co-rumination (CRQ), however the CRQ score of the friend who was listening to the problem (CR NP) does have some predictive power over the levels of negative affect that males report six months after the problem discussion (at T5).

The co-rumination scores of the participants listening to their friends' problems (CR NP) was a significant positive predictor of male NA (across both members of the pair) six months after the experimental interaction (at T5). This finding is contrary to Rose's (2002; Rose et al., 2007) suggestion that co-rumination only leads to negative outcomes for females because it seems that there is a positive relationship between

self-reported co-rumination (of the friend) and negative affect at the six-month follow-up. This is probably nothing to do with the experimental conversation, but more to do with their general co-ruminative tendencies that the pair of friends have. However, it is interesting to find a male significant effect of co-rumination. It will be interesting to see if any more effects of gender concerning male participants manifest in studies where co-rumination is experimentally manipulated, especially to see if there are similar outcomes of co-rumination for males if they are actively encouraged to co-ruminate.

As with Study 1, the coded co-rumination scores (CRCS) and the self-reported co-rumination scores (CRQ) had different effects. It is interesting that the coded co-rumination score (CRCS) was a moderator of effects of time and gender on PA, whereas participants' self-reported tendency to co-ruminate (CRQ) was a moderator of effects of time and gender on negative affect (NA); suggesting that the negative affect may be a result of the pair's general co-ruminative style rather than the level of co-rumination in the experimental problem discussion. These effects will need to be investigated further to examine if the underlying tendency to co-ruminate and co-ruminative interactions have different effects on mental health.

3.5.5 Rumination

Although rumination scores (RRS) positively correlated with negative affect and negatively correlated with positive affect, when analysing participants' rumination score (RRS) as a continuous independent variable there were no significant findings of interest; and therefore no explanation for the results found for positive and negative affect in the current study. This is interesting considering the conceptual overlap

between co-rumination and rumination would lead us to expect that there might be some significant results.

3.5.6 Closeness

It was hypothesised that participants would feel closer to their friend immediately after the problem discussion. However, the results indicated that there was no change in closeness across all of the time-points (before, immediately after, two-weeks after, or six-months after the conversation) for males or females, in either condition, apart from one result when the experimenter made no intervention (no co-rumination condition; No CR); participants who were reporting their problem for discussion (P participants) reported that they felt significantly closer to their friends than participants who were listening to their friend's problem (NP participants) did. From previous research (Rimé et al., 1991) we know that self-disclosure makes individuals feel closer to the listener, and the results should have revealed an increase in closeness for males and females immediately after the problem discussion. It could be the case that these results appear in the No CR condition, but not the co-rumination condition (CR condition), because in the co-rumination condition participants may have been focussing on encouraging the problem talk rather than with sympathising with their friend about the problem or trying to make them feel better about it.

3.5.7 Subsequent Thinking About and Discussing a Problem

It was hypothesised that co-rumination may only lead to decreased positive affect and increased negative affect because those who co-ruminate about a problem subsequently think about a problem more, and discuss it further, after the problem discussion. It could be suggested that the small effect sizes found in Rose et al.'s (2007) research, and the cumulative and reciprocal relationship found between co-

rumination and internalising symptoms, indicate that co-rumination and the resulting affect builds up over time through a process of subsequent thinking about, and talking about, the problem. This may eventually result in clinical levels of depression and/or anxiety if successive problems are not resolved or the co-ruminative spiral is not terminated or interrupted. The results demonstrated that there was no difference between the two conditions in the amount that participants thought or discussed the problem. Analyses to examine whether the frequency with which participants discussed or thought about the problem over time had changed found that there was no change over time and no gender differences. Therefore it is suggested that the reciprocal relationship found in previous studies may be a result of discussing many problems over time, whereas the current research only focused on one problem, which may be slightly unrealistic over a six-month period. However, unsurprisingly, those who were presenting their problem for discussion subsequently thought about the problem significantly more than their friend did. This demonstrates that the person listening to the problem was not experiencing the same level of internalising about their friend's problem as their friend who was presenting their problem for discussion was. When the CRQ and CRCS scores were included in the analyses they had no effect on the levels of thinking or discussing problems and, although this might not be surprising at the six-month follow-up, at least for P participants we might have expected to have seen a relationship between co-rumination and subsequent thinking about or discussing the problem. This will need to be investigated further in future research where co-rumination is manipulated experimentally.

3.5.8 Methodological Issues and Directions for Future Research

Logically, it is not surprising that co-rumination does not have an immediate worsening effect on affect because, if participants were experiencing an immediate negative change in affect after co-ruminating, then they might stop co-ruminating because they may associate it with a negative outcome. However, the findings of the previous study (Chapter 2) do suggest that there is an immediate change in affect and that this change is influenced by co-rumination (coded co-rumination [CRCS] had an overall effect on happiness). However this should be more clearly analysed with experimental research where co-rumination is manipulated because the coding of happiness in the previous study may have been influenced by the facial expressions of the participants in the videos, i.e., those who looked more upset were coded as having higher levels of co-rumination. It might be the case that, when co-rumination is manipulated fully it does have an immediate negative effect and individuals might perceive this effect as necessary to discussing a problem and not consider the longer-term effects on their mental health. Another possibility is that they may misattribute any negative outcome to something other than co-rumination, e.g., the problem itself.

I had assumed that the reason participants co-ruminate is to make them feel closer to their friend immediately afterwards, but the results show that this was not the case. However, as highlighted above, the closeness scores 24 hours before the problem discussion (at T1) show that many participants were already scoring close to the maximum score so any effects that did occur may have been below the level of significance because of the high prevalence of maximum scores at T1 (i.e., a ceiling effect). Although, these ceiling effects were clearly not strong enough to prevent the differences in closeness between conditions reported above. However, in future

studies an additional measure of closeness needs to be adopted to remove the possibility of ceiling effects and co-rumination could be examined in less-close relationships or relationships between strangers (although this would remove an element of naturalism from the study as people do not commonly discuss serious problems with casual acquaintances or strangers). However, it is clear that, when analysing close friendships, participants may just score the maximum on any measure of closeness, so a measure of reciprocal self-disclosure should be included to counteract this; by testing how much the friends disclose to each other we can gain further perspective on the closeness of the relationship. The measure of self-disclosure would also allow the researchers to examine Rose's (2002) original findings, that co-rumination is a bridging concept between self-disclosure and rumination, and examine if co-rumination is really a separate concept or just a combination of these two measures. In the study reported in chapter 4 of this thesis, I include a measure of self-disclosure and a new assessment of closeness to correct for the ceiling effects found in the current study.

A further problem is that we cannot assess at which point co-rumination is having an effect from the current study. An effect was found at the two-week point, but it is reasonable to suggest that the change could be happening before then. Diary research should be adopted (and is adopted for the research in the latter half of this thesis) to analyse this in future, analysing the change in emotion over the days following a co-ruminative interaction. What happens during a co-ruminative interaction is only one element of co-rumination; it is essential to examine a relationship in detail over time to understand why the effects are occurring. In this way, I can analyse the areas of co-rumination which are external to the single interaction; e.g., co-ruminating instead of doing other activities and how co-rumination increases or decreases over time. The

diary studies in this thesis (Chapters 5 and 6) will investigate co-rumination over a series of days to gain a deeper understanding of how daily problem discussions and co-ruminative interactions have an effect on levels of affect.

The present results suggest that it may not be an ideal strategy to analyse co-rumination as a single experimental interaction and include a six-month follow-up because, although Rose (2002) found effects in her original research, it is much more likely that any results are a product of the participant's individual co-ruminative style (which is what Rose was investigating), or as a result of discussing many problems over the months, rather than the single interaction they had six-months previously. Although looking at co-rumination over this period of time is useful, from the current research we can see that the single experimental problem discussion did not really have an effect. Therefore, future research should examine co-rumination in the relatively short-term period after a co-ruminative interaction, thereby also minimising the methodological difficulties of conducting longitudinal research.

Future studies will also have to employ a different experimental manipulation because, as was highlighted previously, the experimental manipulation may not have had the intended effect in the present study. I have suggested that this was due to the fact that, in both the experimental and the control conditions, participants would have been encouraging their friend; in the experimental condition, because they had been asked to by the researcher, and in the control condition, because it would be the participants' natural response to encourage each other to fill the allotted time. A further problem is that co-rumination involves mutual encouragement, whereas the experimental manipulation elicited encouragement from only one participant. However, we must assume that 'mutual encouragement' in the co-rumination

questionnaire suggests mutual encouragement throughout the friendship rather than in every co-ruminative interaction, therefore the use of single participant encouragement is justified. It should also be noted that encouragement is only one of nine criteria for co-rumination and it is suggested that for future studies researchers focus on the more negative elements of co-rumination (e.g., negative feelings and negative consequences) because it is more likely that these elements are contributing to the change in affect; it is these negative aspects that mirror the negative elements in rumination, which has proven depressive outcomes (Nolen-Hoeksema, 1987). The research in the next chapter will use these negative elements of co-rumination to encourage co-ruminative discussion. The research will also use solution-focused and natural discussions to be compared with the co-ruminative discussions.

A further complication is the age of the participants; the current study employed an age range of 18-30, and although we know that co-rumination happens in adulthood (Calmes & Roberts, 2008; Haggard et al., 2011), we do not know if the resulting changes in affect are similar to those found in childhood and adolescence. Therefore when employing an adult sample, and drawing parallels with Rose's et al.'s (2007) study, we must be aware of the cognitive and emotional differences between Rose's sample of children and teenagers (aged 8-15), and the current sample of adults. It may be the case that female participants are not experiencing the same changes in affect as in the original study because their maturity means that they may have better coping strategies, and therefore do not feel the emotional effects of co-rumination as strongly as adolescents. Also, their enhanced life experience may mean that they have better perspective-taking abilities and are not as concerned by their problems as adolescents are, whereas for adult males co-rumination is more non-normative, and therefore they may feel the effects of co-rumination more strongly. Although using children and

adolescents would make the present research more directly comparable to previous studies of co-rumination, the expected emotional outcomes of co-rumination present ethical issues. Therefore an adult sample will be employed in the final experimental study (Chapter 4) but I will report effects on younger samples in the diary research presented later in this thesis (Chapters 5 and 6).

It could also be suggested that using the PANAS to assess depression and anxiety may be why there were some differences in the findings of the current study and the previous literature. The PANAS was chosen because of its reliability and its brevity. However, although it highly correlates with depression and anxiety (Watson et al., 1988), it does not directly assess them. Therefore, although the PANAS is included in Study 3 (Chapter 4) for consistency and comparability, other measures of depression (BDI-II) and anxiety (BAI) are also used in order to allow more direct comparison with Rose's (2002; Rose et al., 2007) research. In addition, the amended self-report measure of co-rumination (CRQ) is used at the final follow-up (two weeks after the experimental interaction), in addition to the first time-point, to examine if self-reported co-rumination changes over time as a result of the experimental manipulation. This will allow me to examine if changes in depression and anxiety also lead to changes in the levels of co-rumination in the particular friendship and compare this with the findings of similar research (e.g., Hankin et al., 2010).

3.5.9 Conclusions

Although the current study does not fully support Rose et al.'s (2007) findings that only women experience the negative effects of co-rumination, the results can be explained, to a certain extent, through both the experimental methodology and findings from previous research. It is clear from previous studies that women co-

ruminate more than men do; however, it would appear that there is a high value in researching co-rumination experimentally because there are obviously some affective outcomes from discussing problems, and it is clear that that co-rumination plays a part in mediating these affective changes. This study clearly shows that it is crucial to research co-rumination both experimentally and within a particular relationship. Only by assessing co-rumination in this way, can we get the breadth of data that is needed to examine something as complex as co-rumination. However, as previously discussed, the experimental manipulation did not work as intended in the current study and it will be crucial in future studies to find an element of problem discussion which does lead to measurable co-rumination. As was suggested previously, future studies could focus on the more negative aspects of co-rumination to facilitate co-ruminate discussions.

4 CHANGES IN AFFECT RESULTING FROM EXPERIMENTALLY MANIPULATED CO-RUMINATION: A THREE-CONDITION STUDY

4.1 Abstract

The current study aimed to extend the findings of the two previous studies into co-rumination by using an experimental manipulation which elicits co-ruminative discussion. Sixty pairs of same-gender friends took part: 10 male and 10 female pairs in each of the three conditions. Participants were asked to discuss a current problem in one of three conditions: co-rumination (asked to discuss the problem negatively) solution-focused (asked to try and solve the problem), and control (no experimenter intervention). Self-reported ratings of depression (BDI-II), anxiety (BAI), co-rumination (CRQ), rumination (RRS), closeness (Inclusion of the Other in the Self Scale; Aron, Aron, & Smollan, 1992; and the FQQ; Parker & Asher, 1993), and Positive and negative affect (PANAS) were taken at different intervals: one week before the problem discussion (T1), immediately before the problem discussion (T2), immediately after the problem discussion (T3), and two weeks after the problem discussion (T4). Results showed that participants co-ruminated more in the co-rumination condition as intended. However the condition did not have an effect on affect following the experimental interaction. Participants experienced significant

decreases in PA and increases in NA two weeks after the problem discussion, regardless of their original experimental condition. Self-reported (CRQ) and coded co-rumination scores (CRCS) had different effects for males and females, and different effects on depression and anxiety. The CRCS had more of an effect on females and the CRQ scores had more of an effect on males. Future research needs to explore ways of examining multiple interactions between friends rather than researching co-rumination in a single interaction.

4.2 Introduction

The research reported so far in this thesis suggests that the gender differences found in previous (correlational) co-rumination research (Rose, 2002; Rose et al., 2007) may not apply to experimental conditions where both males and females are required to discuss problems. The current study is an extension of the previous 2-condition experimental study (Chapter 3). Studies reported in the last two chapters presented some discrepancies, both with each other and with existing literature, which will be addressed in this study.

One minor discrepant finding concerned whether the self-reported co-rumination scores (CRQ) of each member of the friendship pair correlated. In Study 2 there was a significant positive correlation but in Study 1 the positive correlation failed to reach significance. As inter-friend correlations in co-rumination have not been reported in any of the previous literature it will be of interest to find out if these scores correlated in the current study. Due to the fact that both friends are making ratings of the same relationship on the CRQ, we should expect that scores would correlate, and interpret the absence of a significant correlation in Study 1 in terms of the small sample size. The larger sample size (120 participants) in the current study should give a clearer

idea of whether this significant relationship exists. Another issue is whether the coded co-rumination score from the problem discussion (CRCS) correlates with the self-reported co-rumination scores (CRQ) from the two participants within a pair. Again, Study 1 found no correlation but there was a significant positive correlation for Study 2. The current study will further clarify if the two correlate.

The only consistent findings across the two previous studies have lent support for the finding in the existing literature (Hankin et al., 2010; Jose et al., 2012; Rose, 2002; Rose et al., 2007; Tompkins et al., 2011) that females score significantly higher than males on co-rumination. In both previous studies female levels of self-reported co-rumination (CRQ) and coded co-rumination (CRCS; only for one conversation in Study 1) were higher than male levels; therefore I expected to find females scored significantly higher than males on CRQ and CRCS in the current study. However the CRQ measure will be amended slightly in the current study. I was concerned that, because I had amended the CRQ to be friend-specific in the two previous studies, there may be an issue with direct comparability with existing literature, which had used the standard CRQ measure (Rose, 2002). Therefore I would be unable to ascertain whether the presence or absence of any significant results was due to the same factors (in the existing self-report and observational studies) or because I had used a slightly adapted measure of the CRQ. Although I expected that the standard CRQ and my amended friend-specific CRQ would significantly positively correlate, I included both measures in the current study so they could be directly compared and any differences in effects could be assessed.

A further issue with comparability between the existing literature and the previous studies within this thesis was the measurement of depression and anxiety. Affect was

assessed in the first study using one-item measures of happiness and calmness, employed for their brevity during video-cued recall, and in the second study by using the PANAS which could be used to assess changes in affect at close time points. However, although positive and negative affect (assessed by the PANAS) have been shown to significantly correlate with depression and anxiety (Watson et al., 1988), I felt it necessary to include a more robust measure of depression and anxiety in the current study. This would allow not only for more sound assessment of depression and anxiety, but also greater comparability with the existing literature which adopt a mixture of child-specific measures of depression and anxiety (e.g., Rose et al., 2002) and those that use adult measures such as the Beck Depression and Anxiety Inventories (BDI-II and BAI; e.g., White & Shih, 2012). Therefore, in the current study, because it is an entirely adult sample, I used the BDI-II and the BAI to assess depression and anxiety one week before the problem discussion and two weeks after. The PANAS was also included in the current study as the BDI and BAI are not sensitive enough to pick up on same-day changes in affect, which were needed for this research. The PANAS was also included in order to permit direct comparability with Study 2 (Chapter 3).

Study 2's manipulation check did not confirm that the experimental manipulation facilitated greater levels of co-rumination in the co-rumination condition. Therefore a re-assessment of how to manipulate co-rumination in the current study was needed. Rather than focusing on the encouragement element of co-rumination as I did in Study 2, in the current study I focussed on the negative elements of co-rumination. Although this was more ethically challenging to manipulate, it would make sense that the more negative aspects of co-rumination (focusing on negative emotions and consequences) would lead to negative outcomes. In Study 2, I had used a co-

rumination manipulation which only affected one member of the pair (one member encouraging the other to co-ruminate) whereas for this study I felt it would be more ecologically valid to try and induce a natural style of co-rumination which included both members of the dyad. Although the participants in the previous study did report that the conversations felt natural, I felt it would be better to have no element of deception in this study (unlike in Study 2) for both ethical and practical reasons. In the current study three conditions were used; a co-rumination condition (in which participants were asked to focus on all the negative aspects of the problem), a solution-focused condition (in which participants were asked to focus on ways to solve the problem) and a control condition (where no intervention was made). The solution-focused condition was adopted because I felt it was necessary to create a condition which attempted to prevent co-ruminative discussion. In the previous study (Chapter 2) I felt that participants could have been co-ruminating in the control condition and I wanted to create a condition in the current study in which participants were still discussing their problems but not co-ruminating. In this way I would be able to determine whether any effects were due to co-rumination in particular or problem discussion in general. I also kept the control condition in order to assess the effects of natural problem discussion.

Assuming that the co-rumination manipulation is successful, I expected that participants in the co-rumination condition would experience higher levels of rumination, depression, anxiety, negative affect, and closeness, than those in the control or solution-focused conditions (in keeping with Rose's, 2002, original findings, see also Rose et al., 2007). Rose suggested that co-rumination only has negative outcomes (higher depression and anxiety) for females but positive outcomes (closer friendships) for both males and females. The previous studies in this thesis

have only been able to assess this using self-reported and observational measures (due to a failed co-rumination manipulation in Study 2). In the previous studies, I found little evidence that gender moderated the effect of co-rumination on affect; Study 1 found no moderation by gender and Study 2 found very few gender differences in the effects of co-rumination. However, I hoped to be able to address this discrepancy in the literature with the current study, and I expected that if co-rumination was properly manipulated that Rose's (2002; Rose et al., 2007) gender differences would be supported.

In the current study, I decided to assess co-rumination for two weeks after the problem discussion. Although it had been interesting to assess co-rumination in the six months after the experimental interaction in Study 2, it was clear that any effects found at the six-month follow up were independent of the experimental interaction. Therefore in the current study I decided to keep the two-week follow up, for direct comparability with the previous study, but to drop the six-month follow up. I also decided to employ a screening questionnaire one week before the experimental interaction, to assess initial levels of depression and anxiety. Due to the study's focus on negative affect, I decided that it would be unethical to include any participants who reported high levels of depression (see page 118 for details), and therefore excluded these participants (and their friend) after the screening (see procedure below for details). In addition the same pre- and post- interaction time-points as Study 2 were included in the current research to assess any immediate changes in affect.

Ceiling effects of closeness in the previous study meant that assessment of changes in this dependent variable were restricted; this has been amended in the current study by using the Inclusion of the Other in the Self Scale (IOS; Aron et al., 1992), which is a

well-established measure of relationship closeness. This measure was less likely to produce ceiling effects because the highest level indicates an ultimate level of intimacy, which is more comparable to the experience in long-term romantic relationships (represented in the IOS by two circles almost completely overlapping). It is unlikely that many close friends will describe themselves as being so completely intermeshed in each other's lives. The Quality of Relationships Inventory (QRI; Pierce, Sarason, & Sarason, 1991) was also employed at the start of the study as a well-established measure of the participants' relationship. However the 'closeness' item included in the previous studies (1 and 2) was also retained in addition to the IOS and QRI, for direct comparability.

As there was little evidence that the co-rumination manipulation was successful in the previous study, I was unable to assess whether experimentally manipulated co-rumination led to more thinking about or discussing the problem than in the control condition. The study did show that participants presenting their problem thought more about the problem after the conversation (but did not discuss it more). If Rose and her colleagues (Rose et al., 2007) were right that co-rumination leads to closer friendships and increased negative affect (at least for females), then it might reasonably be expected that co-rumination may also lead to further thinking about or discussing the problem. This could then, in turn, lead to further co-rumination. This was preliminarily assessed in the current study and I expected that those in the co-rumination condition would think about and discuss the problem significantly more than those in the solution-focused condition. I also expected that those in the co-rumination condition would show a significant increase in co-rumination (assessed with the friend-specific CRQ) from T1 (one week before the conversation) to T4 (two weeks after the conversation).

Based on existing research (Hankin et al., 2010; Rose et al., 2007), I expected that there would be consistent relationships between co-rumination, rumination, depression, anxiety, self-disclosure, and closeness. More specifically I expected that rumination would explain some of co-rumination's predictive capacity of negative outcomes (depression and anxiety) and that self-disclosure would explain some of co-rumination's predictive capacity for positive outcomes (closeness). This is in keeping with Rose's (2002; Rose et al., 2007) research but has not been addressed in the two previous chapters in this thesis. It was important to investigate whether these relationships could be replicated in an experimental study or whether they depended on the use of cross-sectional self-report data. I also expected that co-rumination and rumination would correlate, as would co-rumination, self-disclosure, and closeness.

4.2.1 Aims

The main aim of the current study was to experimentally manipulate co-rumination. This attempt was not wholly successful in the previous study and the manipulations have been changed and made more specific in the current study. If the manipulation does have the intended effect then I will be able to assess whether Rose et al.'s (2007) findings hold true using an experimental design. Participants in the co-rumination condition should experience significantly higher levels of negative outcomes (depression and anxiety) and positive outcomes (increased closeness) compared with those in the solution-focused or control conditions.

I also hoped to clarify whether the gender differences suggested by Rose et al., (2007) would occur using an experimental design. The previous studies in this thesis have predominantly found that there was no relationship between co-rumination and

negative or positive outcomes exclusively for females (Chapters 2 and 3), and there were very few findings where gender was a factor.

Unlike the previous studies (Chapters 2 and 3), the current study will more robustly assess changes in depression and anxiety using the BDI-II and BAI. This was deemed necessary to be as directly comparable to Rose's (2002; Rose et al., 2007) original co-rumination research as possible. However, the PANAS measure used in previous research was still included in the current study to allow direct comparability with the previous research. In addition, the current research will also assess whether levels of co-rumination are affected by the problem-discussion condition, it will be interesting to assess if co-rumination changes over the duration of the study based on the single experimental interaction.

4.2.2 Hypotheses

1. The same effects found for co-rumination (CRQ) in previous research are expected. Females will co-ruminate more than males and co-rumination (friend-specific; FS CRQ) will significantly positively correlate with rumination, Inclusion of the Other in Self (IOS), closeness, and the Intimate Exchange subscale (self-disclosure).
2. Self-Reported co-rumination (CRQ) scores of both participants in the friendship pair will significantly correlate and both friends' scores will significantly positively correlate with their coded co-rumination score (CRCS).
3. Participants in the co-rumination condition will report significantly higher increases in levels of closeness, negative affect, depression, and anxiety (at T4 compared with their scores at T1), and significantly lower levels of positive

affect, compared with participants in the control or solution-focused conditions.

4. Participants in the co-rumination condition will report significantly higher levels of thinking about and discussing the problem (at T4) compared with participants in the control or solution-focused conditions.

4.3 Method

4.3.1 Participants

The current sample included 60 women (30 pairs of female friends) and 60 men (30 pairs of male friends). Participants were aged 18-30 (M = 20.78 years, SD =2.40). All participants were educated to University level. Participants were asked to identify their ethnicity; 71% of participants identified themselves as Caucasian, 17% as Asian, 1% as African, 8% as Multi-racial, and 3% declined to respond.

All participants reported that they knew their friend well (M =6.24, out of a maximum of 7; SD =0.87). All participants had known each other for a minimum of 3 months and 51% of participants had known their friend for at least a year.

4.3.2 Measures[12]

Demographic. Participants were asked about their gender, age, ethnicity, and education level. Participants were asked to report how well they knew their friend on a 7-point Likert scale, from 1 (not at all) to 7 (very well), and to report how they met their friend, and how long they had been friends (in years and months).

[12] The measures for this study were taken from a larger battery of questionnaires. For a summary of the measures at each time point please see Appendix 9.

Beck Depression Inventory (BDI-II; Beck et al., 1996). The BDI-II is a 21-item measure designed to assess depressive symptoms over the preceding two weeks and each item is rated on a 4-point scale ranging from 0 (no/low symptoms) to 3 (high level of symptoms). There are response alternatives for each question: e.g., (0) I do not feel sad; (1) I feel sad; (2) I am sad all the time and I can't snap out of it; (3) I am so sad or unhappy that I can't stand it. The BDI-II score is obtained by summing the ratings for the 21 items. The maximum total score is 63. A score of 0-14 indicates minimal depression, 14-20 is mild depression, 20-29 is moderate depression and 29-63 indicates severe depression. Therefore, the higher the BDI-II score, the higher the level of depressive symptoms reported. Participants completed the BDI-II as part of the screening questionnaire and at T4. Example response items are, 'I feel my future is hopeless and will only get worse' and 'I can't get any pleasure from the things I used to enjoy'. The measure had good internal reliability (Cronbach's α = .83 and .93, at T1 and T4 respectively).

Beck Anxiety Inventory (BAI; Beck et al., 1988). The BAI is a 21-item measure designed to assess anxiety over the preceding week. The BAI was amended for the current study to assess anxiety in the preceding two weeks to enhance comparability with the BDI-II. Each anxiety symptom is rated on a 4-point scale ranging from 0 (not at all) to 3 (severely) and the BAI score is obtained by summing the ratings for the 21 items. The maximum total score is 63. A score of 0-7 indicates a minimal level of anxiety, 8-15 is mild anxiety, 16-25 is moderate anxiety and 26-63 indicates severe anxiety[13]. Therefore, the higher the BAI score, the higher the level of anxiety reported. Participants completed the BAI at T1 and at T4. Participants were

[13] No participants were excluded based on their anxiety scores (no participants reported severe anxiety).

asked to indicate how much they have been bothered by each symptom during the past two weeks, including today. Example items are, 'Numbness or tingling' and 'Wobbliness in legs'. The measure had good internal reliability (Cronbach's α = .84 and .91, at T1 and T4 respectively).

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). Participants completed the PANAS (see Study 2 for details) at four time-points: T1, T2, T3, and T4. Participants completed two versions of the PANAS; at T1 and T4 participants were asked to report for each of the 20-items, how much have they been feeling that way today, and at T2 and T3 participants were asked to report how much they were feeling that way right now, for each of the items. The PANAS was changed at T2 and T3 because these measures were taken immediately before and immediately after the conversation (on the same day), therefore a more immediate measure of the PANAS was needed. The measure had good internal reliability across the four time-points (all Cronbach's α > .81).

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). The 22-item RRS was used to measure participants' tendency to ruminate at T1 and T4. The measure had good internal reliability (Cronbach's α = .90 and .93, at T1 and T4 respectively; please refer to Study 1 for further details).

Co-Rumination (CRQ; Rose, 2002). The 27-item co-rumination questionnaire assessed participants' tendency to co-ruminate when discussing problems. Participants were asked to complete the standard measure (standard CRQ; assessing the participant's tendency to co-ruminate in general with their same-sex friends) at T1. At T1 and T4 participants were also asked to complete the questionnaire again and, instead of focusing on their closest or best friends (plural), they were asked to

answer in response to how they behave with the friend they were completing the study with. This friend-specific version of the CRQ was used to assess how much the participants engage in co-rumination with the specific friend they were participating in the study with (Please refer to Study 1 for further details of the amended friend-specific CRQ measure and to Appendix 1). The measure had good internal reliability in all three instances (all Cronbach's $\alpha > .96$).

Co-rumination Coding System (CRCS; Rose et al., 2005). The CRCS was used as an observational coding measure of co-rumination from the video for each conversation. Two coders coded the video recordings of the problem discussion (see Study 1 for details). In the current study, an additional Solution-focused item was included (on the same scale) to assess how solution-focussed the participants were being in each conversation. The first coder coded the full set of 40 videos and the second coder coded over half ($n = 26$) of the total videos. Pearson correlations were conducted to examine inter-coder reliability on the 4-coding-areas. The two coders' ratings showed statistically reliable correlations for Encouragement, $r(26) = .48$, $p = .022$, Rehashing, $r(26) = .69$, $p < .001$, Dwelling, $r(26) = .49$, $p = .012$, Speculating, $r(26) = .47$, $p = .017$, CRCS, $r(26) = .39$, $p = .049$, and Solution-Focused, $r(26) = .53$, $p = .006$ (Please refer to Chapter 2 for further details of the CRCS).

Quality of Relationship Inventory (QRI; Pierce et al., 1991). The 25-item self-report measure was employed to assess relationship-based perceptions of social support, conflict, and depth in particular relationships at T1. The 25 items yield 3 factors; Support, Conflict, and Depth; example items are, 'To what extent could you turn to this person for advice about problems?', and, 'How often do you have to work hard to avoid conflict with this person?'. Participants responded on a 4-point Likert scale from 1 (not at all) to 4 (extremely). The measure had good internal reliability

(Cronbach's α = .79). The QRI highly significantly correlated with the closeness variable (see below) and therefore was omitted from the analyses to keep consistency with previous research, which employed the closeness item (For P and NP participants closeness and QRI, support and depth, significantly positively correlated, all $p < .005$).

The Inclusion of the Other in the Self Scale (IOS; Aron, et al., 1992*).* The single-item pictorial measure was used to assess relationship closeness at T1, T2, T3, and T4. Participants were asked to choose one of seven increasingly overlapping circles, 'Please circle the picture that best describes your current relationship with your friend'. The 7 circles were coded from 1 (least close) to 7 (most close).

Closeness. Participants rated 'How close do you feel to your friend' on a 7-point Likert scale (from 1, not close at all, to 7, very close) at four time-points: T1, T2, T3, and T4.

Friendship Quality Questionnaire (IE; Parker & Asher, 1993). Five of the six Intimate Exchange (IE) items were taken from the FQQ. These five items were the same items that were used in the original Rose (2002) study to assess self-disclosure at T1 and T4. Participants were asked to think about the friend they were participating in the study with and assess to what extent each of the statements is true of their friendship. Each item was assessed on a five-point Likert-scale from 1 (not at all true) to 5 (really true) and the FQQ score was calculated by summing the five items. Example items are, 'I talk to my friend when I'm mad about something that happened to me' and 'We always tell each other our problems'. The measure had good internal reliability (Cronbach's α = .86).

Realism of the Conversation. After the problem conversation participants were asked to indicate how similar they found the conversation to conversations they had with their friend in private and how natural they found the conversation. Participants responded to both questions on a 7-point Likert scale ranging from 1 (not at all) to 7 (very).

Importance. Participants were asked to rate how important the problem was to them on a 7-point Likert scale from 1 (not important at all) to 7 (very important).

Subsequent Thinking About and Discussing Problems. Participants were asked two questions to assess to what extent they had been thinking about or discussing the problem subsequent to the experimental interaction: (1) 'How many times have you thought about the problem (which you discussed with your friend in the lab) over the past two weeks when you have been by yourself?', and (2) 'how many time have you discussed the same problem with the same friend over the past two weeks?'. Participants responded to both questions with a numerical answer from 0-100.

Manipulation Checks. Participants were asked to report if the researcher had asked them to discuss the problem in a particular way (negative, solution-focused, or not at all), this was to check that the participants had understood the task that they were set before the problem discussion. Participants were also asked (in all three conditions) to separately rate on a 7-point scale (from 1, not at all, to 7, very much so) how much they felt they discussed ways in which they could try and solve the problem and how much they felt they focused on the negative elements of the problem.

4.3.3 Design

Mixed-design 4 X 2 X 2 X 3 ANOVAs of a range of dependent variables (PA, NA, and closeness) at T1, T2, T3, and T4 were conducted; including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and condition as between-subjects factors. A within-pairs factor ('Person') was used to distinguish which of the two participants in the friendship pair was presenting their problem for discussion, i.e., representing whether the participant was presenting their own problem ('Problem participant' [P participant]) or discussing their friend's problem ('Non-problem participant' [NP participant]). Gender and co-rumination condition (CR Condition: negative condition [CR], the control condition [Control], and the solution focussed condition [SF]) were used as between-subjects factors.

4.3.4 Procedure

The study was advertised using posters, departmental mail-outs, and on volunteer websites. The advert indicated that researchers at Oxford University were interested in researching problem discussion in same-sex friendships[14] and that participants would receive £15 for their participation. Participants who contacted the researchers were sent individual links to the online screening questionnaire. The questionnaire was used to obtain demographic information and to assess the participants' current levels of depression using the BDI-II. Pairs of friends who both scored below 20 on the BDI-II, and had both given full informed consent, were invited to take part in the research. Participants who were above this level (only one participant) were told that they were not eligible for the current study, and both members of the friendship pair

[14] This could have led to a self-selection bias, but given the sensitive nature of the research, instructions from the ethics committee suggested I should include the research's focus of problem discussion in the advert.

were excluded from taking part. The participants were given the contact details of several counselling services in accordance with the advice from the Ethics Committee at the Departmental of Experimental Psychology, Oxford University. Those participants who were eligible were immediately sent the T1 questionnaire. The questionnaire included a battery of Individual Difference measures (BAI, 2-week-PANAS, Intimate Exchange, QRI, RRS, friend-specific CRQ, and standard CRQ). Once both participants had completed the T1 questionnaire they were invited to come into the Social Psychology Laboratory at Oxford University to take part in the experiment. Participants were informed that the study would take around 30 minutes.

When participants arrived they were asked to complete a paper copy of the informed consent form (which they had originally completed during the online screening). Participants were then informed that during the lab study they would be asked to complete a problem discussion and two separate online questionnaires; one before and one after the conversation. Participants were made aware that they could ask questions or withdraw from the study at any time. Participants were then invited to complete the first lab questionnaire (T2; in separate cubicles). The questionnaire was completed using Qualtrics software on individual lab computers. Once participants had completed the questionnaire (which took 6 minutes on average), they were given the problem-selection measure and asked to fill it out by hand. Participants were separately asked to report two problems that they had discussed with their friend (that they were completing the study with) in the past few months. They were told that the problems they selected should be important problems from any area of their life (e.g., work, family, relationships), and, if possible, that they should be ongoing problems which would continue to be problematic in two-weeks-time. Participants were then asked to rate how important each problem was and how worried and depressed they

were about each problem. Once both participants had completed the problem-selection form they were invited back into the main room (from their separate cubicles) to select a problem for discussion. Participants were informed that they would pick one problem (with the researcher) to discuss for 5-minutes and that the researcher would not be involved in the discussion with each other (and would be in a separate room while the discussion was taking place). They were informed that they did not have to discuss a problem if they did not feel comfortable doing so, and they did not have to give any details of the problem (names, explicit details). It was emphasised that, as long as the two participants knew which problem they were discussing, that was sufficient for the study. It was highlighted that participants did not need to explain the problem or repeat the conversation they had previously in any way for the researcher's benefit. For each pair of participants, one participant was selected at random to discuss their problem. The participant's most important problem (from the two problems that the participant had written down) was selected by the researcher for discussion. If participants were not comfortable discussing the most important problem, then the second most important was suggested for discussion. When the participants had confirmed that they were happy to discuss the problem, the researcher invited the participants to sit in one of two chairs, which were set up to face each other. Participants were invited to affix the microphone, which was resting on the chair, as close to their mouths as possible. Each chair had a camera behind it that was positioned to capture the face of the person sitting opposite it.

In all three conditions, participants were informed that the researcher would like them to discuss the problem as naturally as they would in private and in a similar manner. For the control condition, the researcher made no further intervention. For the negative condition, participants were told that, although the researcher wanted the

discussion to be as natural as possible, the researcher also wanted them to exclusively focus, for five minutes, on all the negative aspects of the problem; including any negative emotions, feelings, causes, and consequences that were associated with, or manifested as a result of, the problem. In the solution-focused condition, participants were instructed that, although the researcher wanted the discussion to be as natural as possible, the researcher wanted them to focus, for five minutes, on all the ways they might try and solve the problem, or prevent the same problem, or similar problems, from happening in the future. In all three conditions, participants were informed that the researcher would be in the middle cubicle for the duration of the five-minute conversation and would re-enter the room when the time had passed.

The researcher then addressed any concerns or questions that the participants presented and then started the video recording (using Pinnacle Studio recording software). The researcher ensured that the door to the cubicle was closed to give the participants a sense of privacy. The participants discussed the problem for five minutes and the researcher re-entered the main room when the time had passed. The researcher then invited the participants to re-enter the same individual cubicles, where they had completed their first questionnaire (at T2), to complete the second lab questionnaire (T3; the questionnaire took an average of 11 minutes). When the participants had completed the questionnaire they were invited back into the main room where they completed a video consent form (to allow the video recordings to be used for coding, conferences, and presentations) and were given the details of several organisations who they could contact if they felt any negative change in mood which made them feel upset or uncomfortable. Participants were told they would be contacted by email to complete the two-week-follow-up and that they would be able

to collect their payment after both participants had completed the follow-up questionnaire.

After two weeks, participants were sent the final questionnaire (T4) by email. Questions included the BDI-II, BAI, and friend-specific CRQ. When both participants had completed the questionnaire, the researcher checked the T4 BDI-II scores of each participant. If the BDI-II score was still below 20 then the participants were sent the debrief form and invited to contact the researcher (or several organisations) if they felt any negative change in mood which made them feel upset or uncomfortable. The participants were then invited to collect their payment. If the BDI-II score was above normal for either of the participants, then they were contacted to check the reason for their high scores and offered support in accordance with the BPS Code of Ethics. When the researcher was satisfied that the participant was emotionally stable and understood the nature of the experiment, the debrief form was given to the participants and they were invited to collect their payment and contact the researcher if they felt any negative change in mood which made them feel upset or uncomfortable in the future.

4.4 Results

One pair of participants' data (female in the control condition) was missing from the co-rumination coding due to computer error, resulting in a final sample of 59 pairs for all analyses that use the co-rumination coding scheme.

4.4.1 Correlations

As predicted, Pearson's correlation coefficients revealed that the friend-specific (FS) CRQ and the standard CRQ scores showed a significant positive correlation, $r(118) =$

.91, $p < .001$. Because of the size of this correlation, only results for FS CRQ will be presented (permitting comparability with Studies 1 and 2)[15].

Correlations between the CRQ scores of the two members of each friendship pair were also significantly positive, $r(58) = .52$, $p < .001$. Unexpectedly, CRCS did not correlate with participants' CRQ scores. These correlations were also checked separately for each condition but were all non-significant (for CRQ NP: control, $r(17) = -.25$, $p = .295$; negative, $r(18) = -.04$, $p = .875$; and solution, $r(18) = .15$, $p = .536$; and also for CRQ P: control, $r(17) = .03$, $p = .902$; negative, $r(18) = .34$, $p = .143$; and solution, $r(18) = -.09$, $p = .721$). The conversation variables from the CRQ (an average of each participant's scores on content areas 5-9 of the CRQ) did not correlate with CRCS or any of the CRCS items (Speculating, Dwelling, Rehashing, or Encouragement).

CRQ significantly correlated with rumination (RRS), PA, NA, IOS, and self-disclosure (IE), but not with closeness[16] (for full correlations see Table 6 below).

[15] FS CRQ will be referred to as CRQ throughout the results and discussion sections.
[16] Therefore the results for closeness and IOS were both retained for subsequent analyses, even though the two did significantly positively correlate.

Table 6

Pearson's correlations (all *df* = 118) between CRQ, RRS, 2-week-PANAS (PA & NA), IOS, closeness, and IE.

	CRQ	RRS	PA	NA	IOS	Close	IE	BDI	BAI
CRQ	1	.22*	.27**	.28**	.21*	.15	.47**	.17	.24**
RRS	.22*	1	-.20*	.46**	-.03	.00	.15	.35**	.53**
PA	.27**	-.20*	1	.00	.11	.02	.21*	-.12	-.07
NA	.28**	.46**	.00	1	-.03	.00	.15	.45**	.59**
IOS	.21*	-.03	.11	-.03	1	.52**	.47**	-.20*	-.04
Close	.15	.00	.02	.00	.52**	1	.49**	-.22*	.03
IE	.47**	.15	.21*	.15	.47**	.49**	1	-.07	.10
BDI	.17	.35**	-.12	.45**	-.20*	-.22*	-.07	1	.45**
BAI	.24**	.53**	-.07	.59**	-.04	.03	.10	.45**	1

(*) Indicates significance at the $p < .05$ level, (**) indicates significance at the $p < .001$ level.

CRQ = Co-rumination; RRS = Rumination; PA = Positive Affect; NA = Negative Affect; IOS = Inclusion of the Other in the Self Scale; Close = Closeness; IE = Intimate Exchange; BDI = Depression; BAI = Anxiety.

4.4.2 Gender Differences

As discussed later, females scored significantly higher than males on CRQ (see 4.4.7, CRQ T1 to T4). A two-way ANOVA found no significant main effect of gender on CRCS and no significant interaction between gender and condition. There were significant gender differences found for rumination, anxiety, and IE. For rumination, females scored significantly higher (M = 41.72, SD = 10.25) than males (M = 36.77, SD = 8.65), F (1, 119) = 8.17, p = .005. The same was true of anxiety (BAI); females

scored significantly higher (M = 6.70, SD = 6.34) than males did (M = 4.60, SD = 4.49), F (1, 119) = 4.38, p = .039. Again, the same was true of Intimate Exchange, females scored significantly higher (M = 19.52, SD = 4.02) than males did (M = 15.90, SD = 4.32), F (1, 119) = 22.50, p < .001. There were no significant gender differences found for depression, closeness, PA, or NA.

4.4.3 Manipulation Checks

Manipulation checks, to examine if co-rumination had been facilitated in the CR condition, were conducted using the 'dwelling on negative affect' item from the Co-rumination Coding Scheme, the coded co-rumination score (CRCS), and the solution-focussed variable.

A one-way ANOVA was conducted to examine if there were any significant differences between conditions for each of the four areas of coded co-rumination, general co-rumination, and solution-focussed discussion (at T3). The results confirmed that the manipulation was successful.

There were significant differences for dwelling, F (2, 58) = 3.16, p = .050, speculating, F (2, 58) = 4.03, p = .023, CRCS, F (2, 58) = 4.15, p = .021, and solution-focussed, F (2, 58) = 7.33, p = .001. There was no significant difference between conditions for rehashing and encouragement.

Post-hoc tests (Tukey) revealed that participants in the CR condition scored significantly higher on speculating (p = .040) than participants in the solution-focussed condition, and significantly higher on CRCS (p = .032) than participants in the Control condition. Participants in the CR condition also scored higher on dwelling, but this did not reach significance. Participants in the Solution-focussed

condition scored significantly higher in the solution-focussed item than the participants in the CR condition ($p < .001$; for means and standard deviations see Table 7).

Table 7

Means and Standard Deviations for CRCS, CRCS items (encouragement, speculating, dwelling, and rehashing) and solution-focussed, in each condition (control, co-rumination, and solution-focussed).

	Control Condition *M (SD)*	**Co-rumination Condition** *M (SD)*	**Solution-focussed Condition** *M (SD)*
Encouragement	3.47 *(1.02)*	3.95 *(0.69)*	3.90 *(0.55)*
Speculating	3.37 *(0.76)*	4.05 *(0.94)*	3.35 *(0.93)*
Dwelling	2.74 *(0.99)*	3.55 *(1.23)*	2.80 *(1.15)*
Rehashing	3.47 *(0.70)*	3.50 *(0.76)*	3.20 *(0.83)*
Solution-focussed	2.63 *(0.96)*	2.20 *(1.01)*	3.40 *(1.04)*
CRCS	3.26 *(0.52)*	3.76 *(0.63)*	3.31 *(0.64)*

CRCS = Coded Co-rumination.

Finally the participants were asked after the experimental manipulation if the experimenter had asked them to discuss the problem in a particular way. More than 90% of participants identified their correct condition.

4.4.4 Naturalism Checks

After the problem discussion, participants were asked to rate how natural the conversation felt ($M = 4.77$, $SD = 1.32$), and how similar the conversation was to conversations they have in private ($M = 5.32$, $SD = 1.28$). Participants' scores for naturalism and similarity significantly correlated as in the previous study, $r(120) =$

.61, $p < .001$, therefore the two scores were aggregated into one 'realism' scale (M = 5.05, SD = 1.17). The mean realism (M = 5.05, out of a maximum 7; SD = 1.17) demonstrates that participants perceived the conversation to be very similar to ones they have in private.

ANOVAs were used to examine if there were any significant differences for realism between genders, CR conditions, or persons (at T3). There were no main effects of, or significant interactions with, gender, person, or condition. A one-way ANOVA found no significant differences between the CRQ levels for conditions (prior to the experimental manipulation).

4.4.5 Effects of Time and Condition on Affect and Closeness

Mixed-design 4 X 2 X 2 X 3 ANOVAs of PA, NA[17], closeness, and IOS, at T1, T2, T3, and T4 were conducted; including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and condition as between-subjects factors (for means see Table 8). All the ANOVAs (PA, NA, closeness, and IOS) showed main effects of time[18]: PA, F (2.85, 154) = 3.67, p = .015, η_p^2 = .064; NA, F (2.19, 118) = 6.12, p = .002, η_p^2 = .102; closeness, F (2.91, 162) = 13.92, $p < .001$, η_p^2 = .205; and IOS, F (2.53, 162) = 17.23, $p < .001$, η_p^2 = .242. Pairwise comparisons highlighted that PA was significantly higher at T1 and T2, than at T4 (p = .004), and NA was significantly higher at T4 than at T1 ($p < .001$), T2 (p = .002), or T3 ($p <$ .001). For closeness, participants scored significantly higher at T3 than T1, T2, and T4, and significantly higher at T2 than T1, or T4 (all $p < .001$). The findings for IOS

[17] Due to the differences in the two types of PANAS, the PA and NA ANOVAs were also run separately for T1 and T4, and T2 and T3, but as the results were comparable, the four time-points were included in both the PA and NA ANOVAs.

[18] For the main effects of time for PA, NA, and closeness, Mauchly's test indicated that the assumption of sphericity had been violated. Where $\varepsilon < .75$ the Greenhouse-Geisser correction was used and where $\varepsilon > .75$ the Huynh Feldt correction was used.

matched the significant differences found for closeness at the same time-points (all $p < .001$). There were no main effects of condition or person and no significant interactions (for PA, NA, or closeness scores). The following sections present findings from analyses that added CRQ or CRCS as continuous independent variables.

Table 8

Mean PA, NA, and closeness at T1, T2, T3, and T4.

	T1		T2		T3		T4	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
PA	29.78	5.29	29.85	5.22	29.08	5.71	28.01	5.77
NA	14.40	3.21	13.11	3.31	13.95	3.01	14.71	4.73
Closeness	5.63	0.73	5.83	0.77	5.91	0.73	5.59	0.87
IOS	4.42	1.08	4.69	1.02	4.91	0.94	4.62	0.99

PA = Positive Affect; NA = Negative Affect; IOS = Inclusion of the Other in Self Scale; T1 = 24 hours before the interaction; T2 = Immediately before the interaction; T3 = Immediately after the interaction; T4 = Two weeks after the interaction.

4.4.5.1 Effects of Co-rumination

When P and NP participants' CRQ scores were added separately to the mixed-model ANOVA of PA scores, there was a positive main effect of CRQ P, F (1, 48) = 10.71, $p = .002$, $\eta_p^2 = .182$, but not CRQ NP ($p = .211$). When CRQ (P and NP), and CRCS were added separately to the NA mixed-model ANOVAs, there was a positive main effect of CRQ NP, F (1, 48) = 6.21, $p = .016$, $\eta_p^2 = .112$, but there were no significant interactions of interest.

For PA, there was also a significant interaction between time, person, condition, and CRQ P, F (6, 144) = 3.03, $p = .008$, $\eta_p^2 = .112$. To explain the 4-way interaction, 3-way ANOVAs were run separately for P and NP participants. There was a significant

interaction between time, condition, and CRQ P, for P participants, F (6, 144) = 2.26, p = .040, η_p^2 = .086, but no significant 3-way interaction for NP participants.

Focusing on the P participants only, linear regressions revealed that in the control condition CRQ P positively predicted PA at T1, T2, and T3 (significant at T1, β = .51, r^2 = .26, p = .020, and T3, β = .66, r^2 = .44, p = .002, and near significant at T2, β = .40, r^2 = .16, p = .082), but not at T4 (β = .14, r^2 = .02, p = .560). However, in the co-rumination condition, CRQ P was a significant positive predictor of PA at T4 (β = .53, r^2 = .28, p = .016), but not at T1, T2, or T3 (T1, β = -.19, r^2 = .04, p = .433; T2, β = .38, r^2 = .15, p = .098; T3, β = .25, r^2 = .06, p = .295). The same results were also found in the solution-focussed condition; CRQ P was a significant positive predictor of PA at T4 (β = .50, r^2 = .25, p = .025), but not at T1, T2, or T3 (T1, β = .22, r^2 = .05, p = .347; T2, β = .27, r^2 = .07, p = .253; T3, β = .22, r^2 = .05, p = .354). When coded co-rumination (CRCS) was added separately to the PA and NA mixed-model ANOVAs there were no main effects or significant interactions.

When CRCS was added to the closeness ANOVA, there was no main effect but there was a significant interaction between person and CRCS, F (1, 47) = 5.89, p = .019, η_p^2 = .111. Although both linear regressions were non-significant there was a positive relationship between CRCS and closeness for NP participants (β = .12, r^2 = .02, p = .353) and a negative relationship for P participants (β = -.18, r^2 = .03, p = .172).

When CRQ P was added to the IOS mixed-model ANOVA, there was a significant interaction between gender and CR P, F (1, 48) = 7.59, p = .008, η_p^2 = .136. Linear regressions revealed that CRQ P was a significant positive predictor of IOS for females (β = .53, p = .003), accounting for 28% of the variance, but not for males, where CRQ P was a non-significant negative predictor of IOS. There were no main

effects of or significant interactions of interest with CRQ P for closeness, or CRQ NP for closeness or IOS.

4.4.5.2 Rumination

Rumination (P and NP separately) was added as a second continuous variable to the PA and NA mixed-model ANOVAs (above) to analyse if the main effects of CRQ P (for PA) and CR NP (for NA) would remain significant. They did not. To check whether rumination was a potential mediator of the effects of CR, a linear regression was conducted for PA including CRQ P and Rum P as continuous independent variables. The results of the regression indicated the two predictors explained 24% of the variance; it was found that CRQ P significantly predicted PA ($\beta = .51$, $p < .001$), but T1 Rum P did not ($\beta = -.14$, $p = .256$). Mediation analyses were conducted using the bootstrapping method (Preacher & Hayes, 2004). The 95% confidence interval was obtained using 5000 bootstrapping samples (Preacher & Hayes, 2008). The results of the mediation analysis indicated that the findings were significant ($p < .001$), consistent with the fact that rumination may be a mediator of co-rumination on PA.

A matching linear regression was run for NA including CRQ NP and Rum NP as continuous independent variables. The results of the regression indicated the two predictors explained 12% of the variance; it was found that CRQ NP significantly predicted PA ($\beta = .27$, $p = .037$), but Rum NP did not ($\beta = .17$, $p = .191$). As above, the bootstrapping method was used to examine if the rumination score of the participant who was listening to their friend's problem (Rum NP) was a mediator of the relationship between the co-rumination score of the participant who was listening

to their friend's problem (CRQ NP) and negative affect (NA). The results indicated that rumination was a significant mediator ($p < .003$).

4.4.5.3 Thinking About and Discussing the Problem

Mixed-design 4 X 2 X 2 X 3 ANOVAs of thinking about problems and discussing problems at T3 and T4 were conducted; including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and condition as between-subjects factors. For both thinking and discussing there were main effects of time; F (1, 53) = 36.91, $p < .001$, $\eta_p^2 = .410$, and, F (1, 53) = 30.56, $p < .001$, $\eta_p^2 = .366$, respectively. Participants thought about (M = 11.88, SD = 10.11) and discussed (M = 19.11, SD = 18.09) the problem significantly more in the two weeks following the experimental interaction (T4) than the two weeks preceding it (T3; thought, M = 4.04, SD = 1.14; discussed, M = 5.83, SD = 7.08). For thinking there was also a main effect of person, F (1, 53) = 32.30, $p < .001$, $\eta_p^2 = .379$; P participants thought about the problem more (M = 12.11, SD = 10.40) than NP participants did (M = 3.81, SD = 2.79). For discussing the problem, there was a main effect of gender, F (1, 53) = 4.61, $p = .036$, $\eta_p^2 = .080$; females discussed the problem more (M = 15.22, SD = 11.25) than males did (M = 9.83, SD = 7.79).

When CR NP, CR P, and CRCS, were added individually to both of the ANOVAs as continuous independent variables there were no main effects or significant interactions.

4.4.6 Depression and Anxiety

Separate mixed-design ANOVAs of BDI-II and BAI, scores at T1 and T4 were conducted, including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and condition as between-subjects factors.

Contrary to what was found for PA and NA (above), there were no significant main effects on BDI-II or BAI, but there was a significant interaction between time and person for BDI-II, F (1, 54) = 4.06, p = .049, η_p^2 = .070. At T4, P participants reported significantly higher depressive symptoms (M = 6.03, SD = 7.46) than NP participants (M = 3.75, SD = 5.57), F (1, 54) = 4.86, p = .032, η_p^2 = .083, there was no significant difference at T3. In addition P participants reported significantly higher depressive symptoms at T4 (M = 6.03, SD = 7.46) than at T1 (M = 2.83, SD = 3.69), F (1, 54) = 16.35, p < .001, η_p^2 = .232, there was no significant difference for NP participants. There were no other significant interactions for BDI-II and there were no significant interactions between time, person, gender, or condition for BAI.

4.4.6.1 Co-rumination, Depression and Anxiety

Coded co-rumination (CRCS) and co-rumination (CRQ P and CRQ NP) were added separately to the BDI-II and BAI mixed-model ANOVAs.

When CRCS was added to the BAI mixed-model ANOVA, it had a significant negative main effect, F (1, 47) = 5.68, p = .021, η_p^2 = .108. For BDI-II there was a significant interaction between time, person, gender, condition, and CRCS, F (2, 47) = 6.65, p = .003, η_p^2 = .221. Linear regressions revealed that the only condition where CRCS was a significant negative predictor of depression (BDI-II) was at T4 for NP females in the co-rumination condition (β = -.67, p = .034), accounting for 45% of the

variance, this was not the case for females in the solution focussed or control conditions at T1, or for males in any condition at T4. There were no other main effects or significant interactions for CRCS with BDI-II or BAI.

When CRQ NP was added as a continuous independent variable to the BAI ANOVA it had a significant (positive) main effect, F (1, 48) = 6.51, p = .014, η_p^2 = .119. For BAI, there was a significant interaction between time, gender, and CRQ NP, F (1, 48) = 4.17, p = .048, η_p^2 = .079. Linear regressions revealed that CRQ NP was a significant positive predictor of anxiety (BAI) at T4 for males (β = -.37, p = .042), accounting for 14% of the variance, but not at T1, although the relationship was still positive (β = .24, r^2 = .06, p = .242). For females there was a near significant relationship at T1 (β = .36, r^2 = .13, p = .054) but not at T4 (β = .14, r^2 = .02, p = .468). There was also a significant interaction between person, gender, condition, and CRQ NP, F (2, 48) = 3.40, p = .042, η_p^2 = .124. Linear regressions revealed that the only condition where CRQ NP was a significant positive predictor of anxiety was for NP males in the co-rumination condition (β = .67, p = .035), accounting for 44% of the variance, but not for NP males in the solution focussed or control conditions or for NP females. When CPQ NP was added separately to BDI-II ANOVA there were no main effects or significant interactions of interest, there were also no significant interactions for NA.

When CRQ P was added separately as a continuous independent variable to the BDI-II mixed-model ANOVA there was a significant interaction between time, person, gender, and CRQ P, F (1, 48) = 4.41, p = .047, η_p^2 = .079. Linear regressions revealed that CRQ P was a significant positive predictor of depressive symptoms for P males at T4 (β = .48, p = .008), accounting for 23% of the variance. For BAI, there was a near

significant interaction between gender and CRQ P, F (1, 48) = 3.99, p = .052, η_p^2 = .077. A linear regression revealed that CRQ P was a significant positive predictor of anxiety for males (β = .46, p = .010), accounting for 21% of the variance. There were no other main effects or significant interactions of interest for BAI or BDI-II.

4.4.7 CRQ T1 to T4

A mixed-design 2 X 2 X 2 X 3 ANOVA was also conducted on CRQ scores from T1 and T4; including time (within-subjects) and person (within-pairs) as repeated-measures factors, and gender and condition as between-subjects factors. There were main effects of time, F (1, 54) = 4.75, p = .034, η_p^2 = .081, gender, F (1, 54) = 16.95, p < .001, η_p^2 = .239, and condition, F (1, 54) = 3.87, p = .027, η_p^2 = .125. Participants scored significantly higher on the CRQ at T4 (M = 2.49, SD = 0.73) than at T1 (M = 2.40, SD = 0.68), and females (M = 2.75, SD = 0.71) scored significantly higher than males (M = 2.14, SD = 0.51) on the CRQ. Participants scored significantly higher on the CRQ in the solution-focused condition (M = 2.70, SD = 0.83) than the control condition (M = 2.19, SD = 0.50). There were no significant interactions.

4.5 Discussion

4.5.1 Correlations

Participants' friend-specific and general co-rumination scores did positively correlate with their friend's, which supports the fact that the pairs were reporting on the co-ruminative style of their relationship rather than their own tendency to co-ruminate. Further, the high correlation between participants' general and friend-specific co-rumination scores suggests that people develop a particular tendency to co-ruminate which is similar across relationships with the majority of their close friends.

Alternatively, people may be more likely to become close friends with people who share their co-ruminative style.

Surprisingly, participants' coded co-rumination score (CRCS) did not correlate with either of their self-reported co-rumination scores (CRQ; general or friend-specific). This is contrary to what was found in the previous study (Chapter 3). This seems unlikely to be as a result of the different conditions used in the current study, because there was no significant correlation even when only examining the scores from control condition (which is the only condition which matches with the previous study, and had no experimental manipulation). There were also no significant correlations between coded co-rumination (CRCS) and the conversation-specific items of the friend-specific CRQ. Therefore further research will be needed to examine if co-ruminative interactions do match with participants' self-reported tendencies to co-ruminate.

Other correlations, for the most part, confirmed the original hypotheses. Friend-specific co-rumination (FS-CRQ), Inclusion of the other in the self scale (IOS), and Intimate Exchange, all significantly intercorrelated. Surprisingly, closeness did not correlate with co-rumination contrary to the strong correlation found in the previous 2-condition study (even though the recruitment method for the two studies was identical). However, the correlation with IOS and the very strong correlation with Intimate Exchange are encouraging because they demonstrate that, even in an adult sample, there is a strong link between self-disclosure and co-rumination, and further, that the higher an individual's tendency to co-ruminate the more they perceive their friend as closer and more similar to themselves. The difference between the closeness variable and the IOS measure may have occurred because the IOS is a visual measure

and therefore may assess closeness in a different way to the single-item closeness measure (although closeness, IOS, and Intimate Exchange, did all significantly correlate).

As predicted, rumination correlated with co-rumination; this reinforces the relationship found between these variables found in previous research (e.g., Rose, 2002; Rose et al., 2007). However, rumination did not correlate with self-disclosure (IE) as would be expected given Rose's (2002) findings. On the other hand, both rumination and self-disclosure correlated with co-rumination; supporting Rose et al.'s (2007) theory that co-rumination is the bridging factor between the two.

CRQ significantly positively correlated with positive affect (PA) and negative affect (NA), suggesting that there is a strong relationship between participants' tendencies to co-ruminate and their trait levels of depression and anxiety (assessed by the PANAS). CRQ also significantly positively correlated with anxiety (BAI), but not depression (BDI-II), suggesting that the BDI-II may be assessing levels of depression differently from the positive affect measure.

4.5.2 Manipulation Checks

Manipulation checks confirmed that the manipulation worked successfully in Study 3 (unlike in Study 2). CRCS scores revealed that participants in the negative condition focused significantly more on negative affect, and co-ruminated more overall, than participants in the other two conditions. In addition, participants in the solution-focussed condition scored significantly higher on the additional solution-focused coding item than participants in the other two conditions. Participants in the co-rumination condition also scored significantly higher on speculating about parts of the problem that are not understood. In addition to the manipulation checks it is also

important to note that participants found the conversation similar to conversations they have in private. Unexpectedly, female participants rated the solution-focussed condition as significantly more natural than males did. This is an interesting finding as it is usually suggested that men are more solution-focussed than women (Billings & Moos, 1981) and therefore we would expect men to find this discussion style more natural. In addition, female participants found the solution-focussed condition more natural than the control condition, perhaps because participants found it harder to fill the time in the control condition (as suggested above for Study 2). In the present study, females apparently experienced this difficulty more than males.

4.5.3 Gender Differences

The gender differences found in the previous co-rumination literature (Rose, 2002; Rose et al., 2007) were also found in the current study; female participants scored higher on self-reported co-rumination than males did. However, the coded co-rumination score (CRCS) did not show the same pattern of results as in the previous studies (Chapters 2 and 3). This is surprising, especially since there were no gender differences in the control condition, which should show the same gender differences as Study 2. Females also reported significantly greater rumination, anxiety, and self-disclosure, which was in keeping with previous research (Nolen-Hoeksema & Morrow, 1993; Rose, 2002; Rose et al., 2007). However, surprisingly females did not report significantly higher levels of depression, closeness, PA, or NA.

4.5.4 Affect

When examining PA and NA across the four time-points in the current study, there is clearly a change over time. The results highlight that for both PA and NA there is a change after the conversation. For PA this change does not happen immediately after

the conversation, but by the two-week follow-up PA has significantly decreased compared with immediately before the conversation and one week before the conversation. This gradual dip in positive affect, which includes a slight non-significant dip after the conversation, has been found in Studies 2 and 3 in this thesis. It would appear that the effect that the conversation is having does not manifest until an, as yet, undetermined point in the subsequent two-weeks. However, as with previous studies, as there is no effect of condition we cannot say that this decrease in PA is a result of co-rumination and, as we have no non-problem discussion control condition, we cannot really say that it is a result of problem discussion.

The same time pattern also applied to NA; there was a slight non-significant increase in NA immediately after the conversation and by the two-week follow-up this had become a significant difference compared with the scores before and after the conversation. The high NA score at T1 may have been due to fatigue from the lengthy questionnaire. Alternatively it could be the case that participants were originally experiencing high negative affect because of a problem and the opportunity to discuss that problem led to a temporary drop in NA. Alternatively, the effect may have nothing to do with the problem discussion and instead be due to the fact that interacting with their friend made them feel temporarily less negative.

When self-reported co-rumination (CRQ) scores for each member of the pair were added as continuous independent variables, for PA and NA there were main effects of CRQ; for PA there was a positive main effect of the co-rumination score of the participant presenting their problem for discussion (CRQ P), and for NA there was a positive main effect of the co-rumination score of the person listening to their friend's problem (CRQ NP). It is interesting that CRQ scores of the two members of the dyad

influence PA and NA differently, given the fact that in the first study only CRQ P influenced happiness (albeit using a different measure of happiness) and in the second study only CRQ P interacted with time and gender. This inconsistency may be to do with the slightly different examination of affect (happiness and calmness in Study 1, and PA and NA in Studies 2 and 3) and the differing methodology of the three studies. It is interesting that in the current study positive affect (which is strongly linked with depressive symptoms; Watson et al., 1988) is affected by the co-ruminative style of the person presenting their problem for discussion, whereas negative affect (anxiety) is influenced by the co-ruminative style of their friend (who is listening to the problem). The finding that anxiety is influenced by the listener's co-ruminative style is also supported by the main effect of CRQ NP on the anxiety scores (BAI).

There were also several interactions between CRQ NP and time, gender, condition, and person. The findings indicated that CRQ NP was a positive predictor of anxiety (BAI) for males at T4 and for NP males (males listening to their friends' problems) in the CR condition. The results for males are interesting because they suggest that the co-rumination score of the males who were listening to the problem had an effect on the anxiety of all males at the two-week follow-up (T4), and themselves (NP males) in the CR condition. It is interesting that this effect should only be for males, as the previous research (Rose, 2002; Rose et al., 2007) would suggest that we might expect to find these results for females, but not males.

The further 4-way interaction found for PA suggests that CRQ P was a significant positive predictor of PA in the co-rumination and solution-focussed conditions at the two-week follow-up (T4). This can also be compared to the findings that suggest that

CRQ P is significant positive predictor of depression for P males at T4, and more generally of male anxiety (across times and conditions), which suggests that the CRQ score of the person presenting their problem for discussion had differing effects on negative affect at different time points for different conditions. It is interesting that it had an effect on male anxiety and depression, although there is no interaction with condition (for any of the interactions with gender), as before, we would not expect this given the previous findings which suggest that co-rumination only leads to negative outcomes for females (Rose, 2002; Rose et al., 2007). However, the findings also suggested some effects for females; when the coded co-rumination scores (CRCS) were examined there were interactions with gender that predicted changes in depressive symptoms (BDI-II) exclusively for females (NP females, in the CR condition, at T4). This suggests that the coded and the self-reported co-rumination scores were having differing effects for males and females, and different effects on depression and anxiety, with the coded co-rumination scores (CRCS) having more of an effect on females and the self-reported co-rumination scores (CRQ) having more of an effect on males. This could be due to the fact that the things that the CRQ assess (i.e., spending a great deal of time discussing problems in dyads in a negative manner) are more normative for females and so a high CRQ score for females does not necessarily lead to negative outcomes. This could possibly be because when the female participants are answering the CRQ they may not be focussing very clearly on whether they discuss problems in a negative way, but instead may just be scoring themselves highly because they spend a lot of time discussing problems in dyads. Males may be more accurate at assessing how much they co-ruminate because co-rumination is not seen as typical male behaviour. By contrast, when females are asked to discuss problems in the lab, this may have a more negative impact (than the CRQ

score). This may not be the case for males, possibly because they are able to be more solution-focussed about the problem once they have left the lab.

4.5.4.1. Rumination

When rumination was added to the affect (positive and negative affect) analyses it was demonstrated that for the main effects found for the co-rumination score of the participant presenting their problem for discussion (CRQ P) and positive affect (PA), and the co-rumination score of the participant listening to their friend's problem (CRQ NP) and negative affect (NA), rumination was a likely mediator. This is in keeping with Rose's (2002) findings that suggested that co-rumination only had an effect on negative outcomes because of co-rumination's shared variance with rumination. However this does not devalue using co-rumination as a measure because rumination cannot explain the findings of past research which suggest that it increases feelings of closeness between the friends.

4.5.5 Thinking and Discussing Problems

The findings from the results from thinking about and discussing problems were quite surprising. We would have expected those in the co-rumination condition to have thought about and discussed the problem more often than in the other two conditions, but there were no significant interactions with condition for thinking or discussing. Although some differences were reported (participants presenting their problem for discussion did think about the problem more than those listening to their friend's problem) this lack of effect for condition was probably due to the fact that the two week follow-up may not have been sensitive enough to pick up any differences. We would expect that if a person was going to think about or discuss the problem (most probably after co-ruminating) this may have been in the days following the

experimental interaction and they may have forgotten the intensity to which they did this by the two week-follow up. Daily assessments of these dependent variables following the experimental interaction may be more precise and could be employed by future researchers to examine if co-rumination leads to further thinking about or discussing the problem which then, in turn, could lead to further co-rumination.

4.5.6 Closeness

The main effects of time on both the Inclusion of the other in the self scale (IOS) and closeness showed that participants felt closer immediately before the conversation (T2) and immediately after the conversation (T3), than one week before (T1) or two weeks after the conversation (T4). This can be explained by the direct contact between the two members of each pair during the experiment. When coded co-rumination (CRCS) was added to the closeness mixed-model-ANOVAs, it had an effect on the level of closeness for both P and NP participants. Interestingly there was a positive (non-significant) relationship between CRCS and closeness for NP participants and a (non-significant) negative relationship for P participants. This suggests that those who were presenting their problem for discussion felt less close if there was a high level of co-rumination during the experimental interaction, whereas those who were listening to their friend's problem felt closer to them if there was a high level of co-rumination. The second finding is not particularly surprising because it is not unexpected that we might feel closer to someone who was repeatedly focussing on the negative aspects of their problem (i.e., when they are co-ruminating). However it is surprising that those disclosing their problem felt less close with increasing levels of co-rumination, because we would expect the self-disclosure element of co-rumination would make them feel more close to the person listening to

their problem. However, the linear regressions for these findings were non-significant so this will need to be examined further in future to draw firmer conclusions.

Although there was no main effect of gender on closeness (both males and females experienced decreased closeness after the experimental interaction in the co-rumination condition), when CRQ P was added separately as a continuous independent variable to the IOS ANOVA, this variable significantly interacted with gender. CRQ P was a significant positive predictor of IOS for females, but not for males (unlike in Rose's, 2002, study). However if co-rumination only has positive outcomes for females, as this finding suggests, then this would explain why females report that they co-ruminate more than males do (Rose, 2002; Rose et al, 2007). However it should be noted that Rose used a different measure of emotional closeness which she created from three existing measures designed for use with children and adolescents (Rose, 2002), therefore this may explain the discrepancy in results. Rose and her colleagues (Rose et al., 2007) suggest that co-rumination leads to increased closeness because of its shared variance with self-disclosure but, as there were no main effects of CRCS or CRQ on closeness, mediation analyses were not conducted with self-disclosure as a second continuous independent variable.

4.5.7 Changes in Co-rumination T1-T4

In the current study, CRQ was analysed one week before the conversation (T1) and two weeks after (T4), this was to assess whether there were any changes in co-rumination due to the problem discussion. However there was only one interaction with time, and unfortunately none between time and condition. The findings suggested that females scored significantly higher on friend-specific co-rumination at the two-week follow-up (T4) than they did one week before the experimental

interaction (T1). This suggests that for females, but not males, interacting with their friend (or possibly discussing problems with their friend) led to more co-rumination with that friend after the experimental interaction. This is not completely surprising as Rose et al. (2007) suggested that the increased closeness, and higher depressive and anxious symptoms, that co-rumination produces also lead to further co-rumination. However, it must be noted that there was no interaction with condition so we do not know if this was a result of co-rumination, problem discussion in general, or simply spending time with their friend. In future studies, it would be of interest to include a control condition in which the friends spend the same amount of time together but do not discuss any problems (a non-problem discussion control condition). There were also main effects of time, gender, and condition. Unsurprisingly participants co-ruminated significantly more at T4 than at T1, and females co-ruminated more than males. However, again, as there was no interaction with condition, we cannot say if this was as a result of co-ruminating during the experimental session.

The main effect of condition suggested that those in the solution-focussed condition co-ruminated more overall. This difference partly reflected the non-significantly higher co-rumination scores in the solution-focussed condition prior to the manipulation, so this may simply have reflected failure of randomization. This could be made less likely in future studies by using a much larger sample size.

Although it was disappointing that the condition did not have an effect on affect following the experimental interaction (participants experienced significant decreases in PA and increases in NA two weeks after the problem discussion, regardless of their original experimental condition), this study still makes a significant contribution to the literature by demonstrating that co-rumination can be manipulated in an

experimental study and that co-rumination has differing effects, not only for each member of the dyad, but also for both males (using the CRQ) and females (using the CRCS). The study has also supported the findings of previous research that females co-ruminate significantly more than males do, and that there is a significant positive correlation between the CRQ scores of the members of the dyad. Other researchers have not exploited this dyadic nature of the research, and it would seem that it is an area ripe for future investigation. It is clear from the results of this study that, although friends do share a joint co-ruminative style, there are differing effects of co-rumination for each member of the dyad and future research should examine these differences further to investigate whether they have implications for health outcomes. Further, these relationships should also be investigated over time to examine whether these co-ruminative outcomes exacerbate the more a problem is discussed between two friends.

4.5.8 Methodological Issues and Directions for Future Research

Although this study addresses many of the methodological problems of the previous research in this thesis, there are still several issues which need to be addressed. It would be useful in future research to use a control condition which does not include problem talk. It was difficult in the current study to assess the magnitude of the effects because the control condition required participants' natural behaviour (which may or may not have been co-ruminative), rather than a non-problem discussion. Ideally future studies should have these four conditions (co-rumination, solution-focussed, natural, and non-problem control) for a full assessment of effects of co-rumination.

To be directly comparable to Rose's (2002; Rose et al., 2007) research, larger samples need to be employed in future research. It could be the case that Rose's (2002; Rose et al., 2007) results were not exactly replicated in the experimental studies because Rose's samples were 15x larger than the current study and the small effect sizes found in her research may not have reached significance in the current study. However, the lack of comparability of the observational and experimental research in this thesis with Rose's research may be due to the fact that I employed exclusively adult samples. Due to the lack of consistency in results across the previous three studies, it would be unadvisable to conduct experimental research on under-18s. It could be the case that there is wider differentiation in the resulting affect from co-rumination in adult samples and therefore the results found in Rose's (2002; Rose et al., 2007) research were not mirrored in this experimental research. The next three studies in this thesis will employ diary designs (two of them with child and adolescent samples) to examine if co-ruminative discussions lead to changes in mood. Using the diary method will not only allow me to use younger samples (because the participants are self-reporting their natural behaviour and there are therefore fewer ethical issues) but will also give a more accurate assessment of how co-rumination changes day-to-day.

Looking back across the three studies presented in the thesis (1, 2, and 3) it is clear that there are some encouraging findings. Females consistently scored higher than males on CRQ, and in the two larger studies (2 and 3) there were significant correlations between both members of the dyad, suggesting that close friends do have a joint co-ruminative style within their relationship. However there were also results which showed some disparity across the three studies. The relationship between the co-rumination score (CRQ) and coded co-rumination score (CRCS) will need further examination, as the two should significantly positively correlate, but this was

generally not found to be the case. Also, there was some inconsistency in the emotional outcomes of co-rumination; I expected that only females would experience negative outcomes, but this was not the case. It would seem that across the three studies the CRCS mainly had an effect on depressive outcomes, however it did have a main effect on anxiety in the current study, and in some cases this was for both genders, but in some instances the coded co-rumination score (CRCS) was only predictive of females' levels of depression and anxiety. The self-reported co-rumination scores (CRQ) also had varying effects across the studies; in some cases CRQ was predictive of negative outcomes for males, but not females, and in some instances the opposite was true. This instability across results, although challenging, is not wholly unexpected given the experimental nature of the research and it is clear that future research should also include the BDI-II and BAI (as in the current study) as these more closely match to Rose's (2002; Rose et al., 2007) original measures.

The findings for rumination in particular across the first three studies in this thesis have been interesting; the findings from this study suggest that rumination is a likely mediator of the relationship between co-rumination (CRQ) and PA, and co-rumination and NA. However, the lack of effect that rumination had in Studies 1 and 2 indicates that the relationship between rumination, co-rumination, and their potential emotional outcomes, needs more investigation. This investigation will prove difficult until there are more clear outcomes from studies which investigate experimental co-rumination. The wide range of results across the observational and experimental studies presented has made it hard to draw conclusions about the relationships between these variables (co-rumination, rumination, depression, and anxiety).

4.5.9 Conclusions

Although there was no effect of condition on affect in the current study, it is encouraging that this study has demonstrated co-rumination can be manipulated by focussing on the negative aspects of the problem. This is a great achievement for co-rumination research as no existing studies indicate how co-rumination can be manipulated within an experimental design. This manipulation will allow future researchers to investigate whether co-rumination does lead to positive and negative outcomes (hopefully using larger sample sizes) and, in time, this experimental research will need to be conducted on child and adolescent samples to fully examine whether co-rumination has the strong adaptive and maladaptive outcomes that Rose (2002; Rose et al., 2007) suggests it has on adolescent girls. The study has also uncovered some interesting gender differences which suggest that the coded and the self-reported co-rumination scores were having differing effects for males and females (and different effects on depression and anxiety); the coded co-rumination scores (CRCS) had more of an effect on females, and the self-reported co-rumination scores (CRQ) had more of an effect on males. This study also highlighted some interesting differences in the outcomes of co-rumination for each member of the dyad; positive affect (depression) was affected by the co-ruminative style of the person presenting their problem for discussion, whereas negative affect (anxiety) was influenced by the co-ruminative style of their friend (who was listening to the problem). I believe this dyadic approach to co-rumination presents a good foundation for future experimental research, and it is clear that more research is needed to disentangle the effects of co-rumination on depression, anxiety, and closeness.

5 CO-RUMINATION IN ADULTS: A DAILY DIARY STUDY

5.1 Abstract

The current study aimed to investigate co-rumination in a diary sample of adults aged 19-23. Forty-three participants (18 male and 25 female) completed an on-line 10-day diary, assessing problem discussion and changes in mood. The research was largely exploratory, although it was expected that self-reported co-rumination (CRQ) would positively predict negative emotion on problem discussion days, especially for female participants. The results indicated that CRQ did not have this effect and the only result which was significant (which included the CRQ) was that it was a significant positive predictor of general negative emotion (not problem-specific emotion) regardless of whether the day was a problem-discussion day or not. There were also no significant gender differences. There were some problems with missing data, which future studies could correct if participants completed their diaries in a more controlled setting, in the presence of the researcher, rather than on-line. The limited number of significant findings could be due to the measures used to assess positive and negative emotion and more established measures, such as the PANAS are recommended for future diary research.

5.2 Introduction

Co-rumination cannot be entirely accurately assessed without using diary measures. In previous experimental research, where diary measures have not been employed, researchers have relied upon retrospective self-report measures to obtain insight into effects of co-rumination on friendship over time. The reliance on participants accurately remembering their actions and emotions from previous problem discussions may lead to interpretational problems. Participants' perceptions of their friendship may have affected their assessment of how they actually behaved. Therefore, to gain an accurate insight into the frequency and nature of co-ruminative interactions within a friendship over time, diary measures need to be employed. Although diary measures too have methodological limitations (e.g., missing data across the diary period), and it is unrealistic to suggest that an entire relationship can be practically assessed using diary measures, the method should at least give researchers greater insight into several key areas of co-rumination that would be less accurately assessed using a single time-point assessment.

The three diary studies, which were conducted as part of this thesis, were largely exploratory. Due to an absence of past literature on gender differences in problem discussion, the three studies are offered as a starting point for investigating this area and are by no means exhaustive. They assess emotion ratings over time in three different samples to examine if there are gender differences in the way men and women discuss problems (in the first study) and, more generally, the emotional outcomes of problem discussion and co-rumination. The first study employs young adult sample (19-23), and the second employs adolescents (16-18), while the third

employs children and adolescents (11-16). Although the three studies are not directly comparable, inferences can be made by drawing on their cumulative findings.

5.2.1 Gender Differences in Problem Discussion

Research into self-disclosure has suggested that females self-disclose more than males do (Calmes & Roberts, 2007) and more recent research into perceived emotional outcomes (Rose et al., 2012) has indicated that female children and adolescents self-disclose more than males do because they expect significantly more positive outcomes than males do. However, further research is needed to ascertain if participants' perceived outcomes match with the reality of self-disclosure. To begin to investigate co-rumination using the diary method, firstly an investigation of problem discussion (a type of self-disclosure) more generally is needed. Previous research into gender differences in problem discussion is sparse. Most of the research in the friendship literature focuses on gender differences in self-disclosure in general and not problem discussion in particular. As co-rumination is one type of problem discussion it is clear that problem discussion needs to be investigated before more complex studies into co-rumination are conducted. The current study focussed on the emotional outcomes of one problem discussion, and used the CRQ to assess the participants' tendency to co-ruminate, rather than assessing how much the participants had been co-ruminating over the dairy period, this allowed for a brief daily diary, and removed the complication of having to get participants to self-assess how much they had been co-ruminating.

The researchers that have investigated problem discussion specifically, as opposed to the more general area of self-disclosure, have found that there are gender differences in the motivations for problem discussion. Rose et al. (2009) found that boys were

less likely to prompt their friends to discuss problems than girls. However, girls' reasons for refraining from discussing problems are more prosocial than boys' (e.g., not wanting to upset the other person). Boys were equally likely to report refraining from problem discussion due to both prosocial (e.g., not wanting to embarrass the other person) and selfish (e.g., not wanting to feel depressed themselves) reasons. This research demonstrated that there are interesting gender differences in problem discussion and it is clear that further basic research into gender differences in problem discussion is needed, using the CRQ as a predictor, before more ambitious research into the nature of co-rumination specifically is conducted.

5.2.2 Diary Studies

Although several studies have investigated co-rumination longitudinally, by including several time-points to assess changes in co-rumination over time (e.g., Hankin et al., 2010), only one very recent study[19] has investigated co-rumination using a diary method. White and Shih's (2012) research investigated co-rumination over a 7-day period using a sample of 279 college students. During the study they assessed baseline co-rumination and depression, recorded twice-daily measures of depressed mood, and also collected daily measures of co-rumination and stressful life events. The research investigated conversations with closest confidants, who were usually the participants' best friends, parents, significant others or roommates. Previous research has found that the effects of co-rumination suggested by Rose (2002; Rose et al., 2007) do not apply equally across all of these relationships. For example, CRQ has little effect in relationships with parents and significant others (Calmes & Roberts, 2008). Given that 42% of White and Shih's sample consisted of participants who

[19] This study was published after the current study was conducted.

identified their closest confidant to be their parent or significant other, this should be taken into account when discussing any findings of this research.

For the daily co-rumination measure, the researchers adapted the CRQ using only the second half of the questionnaire, as they believed this half is more focussed on what happens within a specific conversation. However this should be treated with caution as not all areas of (conversation-specific) co-rumination are covered in the second half of the CRQ. They found no gender differences in the reported levels of co-rumination (using the CRQ). However women did report significantly higher levels of co-rumination in the daily measures. This difference highlights the advantages of supplementing cross-sectional data with diary data. Further investigation of whether men or women are overestimating or underestimating their levels of co-rumination on the CRQ also seems merited (the relevant means were not presented in White & Shih's, 2012, article).

White and Shih (2012) also found no effects of gender on daily mood or stress. However, the research did not examine same-sex close friendships exclusively, making it hard to draw strong comparisons with Rose's work (2002; Rose et al., 2007). Nevertheless there were some interesting associations between mood, stress and co-rumination. Daily co-rumination positively predicted within-day changes in (worse evening) mood, after controlling for daily stressors (and morning mood), and participants with higher baseline co-rumination showed stronger associations between daily stress and daily depressed mood. However, this moderated effect was not found for daily co-rumination. Finally, daily co-rumination with the closest confidant was positively associated with within-day worsening of mood. These findings suggest that co-rumination affects daily mood and that it might be a key factor in depression and

anxiety. However, the research also suggests that there were differing effects reported for the CRQ and daily co-rumination, suggesting that the CRQ may not be representative of daily co-ruminative interactions. One possible reason for these discrepant effects is that White and Shih's shortened daily measure of CRQ was not comprehensive enough.

The White and Shih (2012) study is a useful starting point for co-rumination research using the diary method. However, due to a lack of basic research into gender differences in problem discussion and the expense and time it takes to conduct diary research, it is important to investigate what gender differences, if any, are apparent in general problem discussion and if these differences relate to CRQ scores. The present diary study, which was conducted prior to the publication of the White and Shih (2012) study, aimed to begin this exploratory research.

5.2.3 Aims and Hypotheses

The aim of the current study was to analyse gender differences in problem discussion using a time-dependent diary method over a 10-day period[20]. Participants were asked to keep a diary for 10 days detailing problem conversations and reporting daily mood. Although there was no daily assessment of whether conversations were co-ruminative or not, the current study used the CRQ as a general (rather than daily) measure, taken at the end of the diary period. The comparison of problem days and no-problem days allowed for a more comprehensive examination of problem discussion than I was able to conduct with the single experimental interaction found in the previous three studies. The no-problem days give a baseline level of affect which problem discussion days can be compared with.

[20] 10 days was chosen as the duration of the study as this was the length of the course that the students were studying and they could not complete any more diary measures after the course completion.

1. Co-rumination will significantly correlate with rumination, positive affect, and negative affect, as found in existing research (Rose, 2002; Rose et al., 2007), and Studies 1 and 3 (but not Study 2).

2. Women will report significantly more problems than men (because they self-disclose more), will have longer conversations with their friends and report that their problems are more important to them.

3. Participants will report significantly higher levels of NE on problem days than non-problem days.

4. For NE, CRQ will interact with gender and problem. CRQ will be a significant positive predictor of NE for females on problem days (in keeping with Rose's, 2002, research) compared with non-problem days. There will be no significant difference for males between their reported NE on problem and non-problem days.

5.3 Method

5.3.1 Participants

A sample of forty-seven participants was recruited. However due to incomplete data only 43 participants were used in the final sample (18 male and 25 female). The participants were aged 19-23 (M =20.00, SD =0.85) and over half (54%) were second year Psychology undergraduates at Oxford University who participated in the study as part of a 4-week Social Psychology course. All student participants were asked to recruit a friend of the opposite gender to participate (to create a more equal gender distribution in the sample). Participants were informed that their course credit was not dependent on their completion of the study and all participants were told that they

could withdraw their data at any time without it affecting their (or their friend's) grade. All participants identified themselves as full-time undergraduate students. Eighty-one percent identified themselves as Caucasian, 9% identified themselves as Asian/Pacific Islander, 7% identified themselves as other/multi-racial and 2% declined to respond.

5.3.2 Design and Procedure

Participants were e-mailed a link to an on-line questionnaire every evening for 10 days[21] prompting them to complete mood ratings and provide details of a problem discussion (if one had occurred). If no problem discussion had occurred participants were asked to just complete the mood rating. Participants reported on up to three problems per day[22]. At the end of the diary period all participants completed the co-rumination scale (Rose, 2002) online, together with additional measures, which will not be discussed here. Participants were fully debriefed and given the opportunity to ask questions.

As there were several instances of missing data over the diary period, participants' most important problem day was analysed along with the closest non-problem day on which they completed an emotion rating. The no problem days were counter-balanced (half before and half after the problem day) to avoid any order effects[23]. Participants who did not complete more than one day of the diary, did not report any problems

[21] In order to fully exploit possibilities for time-based data analysis, a longer diary period would have been preferable (e.g., 28 days suggested by Bolger, Davis, & Rafaeli, 2003) but for practical reasons a 10 day diary period was used in the current study, because it was the maximum time that the participants were available to participate.

[22] As most participants (>90%) only answered with one problem per day, only the information from one problem (the most important problem that was always reported first) was used in this study. The data for the remaining problems was not used for this study.

[23] An independent variable representing whether the no-problem day was before or after the problem had no significant effects when included in all the analyses of simple main effects (below), and so will be excluded from this presentation for the sake of clarity.

over the diary period, or who reported no days without problems[24] were excluded from the analysis. This resulted in a final sample of 43 participants.

5.3.3 Measures

Demographic. Participants were asked to indicate their gender, age, education level, and ethnicity.

Co-Rumination (CRQ; Rose, 2002). The 27-item co-rumination questionnaire, taken at the end of the diary period[25], (Cronbach's α = .95) assessed participants' tendency to co-ruminate when discussing problems (Please refer to Study 1 for further details and to Appendix 1 for the full measure).

Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). The 22-item RRS, taken at the end of the diary period, was used to measure participants' tendency to ruminate. The measure had good internal reliability (Cronbach's α = .92; Please refer to Study 1 for further details).

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). Participants completed the PANAS questionnaire at the start of the study. They completed a state measure of how they had been feeling (for each affect item) over the past month (see Study 2 for further details).

Mood Scales. Participants were asked to complete the general mood scales everyday (even if they had not discussed a problem) to indicate how they were

[24] However, there were no participants, who had completed the study, who reported problems on every day of their diary.

[25] The co-rumination measure was taken at the end of the diary period because I did not want the participants' problem discussions to be influenced by their knowledge of co-rumination (especially because the participants were Psychology students). However it must be noted that the participants' perceptions of how much they were co-ruminating may have been influenced by completing the daily diary, this was addressed by emphasising to participants when they received the CRQ that they must answer with regard to how they generally behave.

currently feeling on 11-point Likert scales (0 = Not at all, 10 = Extremely). Items were happy, sad, anxious/worried, relaxed, angry, excited, and content (the same items were also used for a problem-specific mood rating). Factor analysis (using oblimin rotation) of the general mood variables (happy, sad, anxious, relaxed, angry, excited, and content) from the reduced data set of one problem day and one non-problem day per participant suggested a two factor solution (Eigenvalues > 1), with positive emotion items (happy, relaxed, excited, and content) loading high on one principal component (PE; accounting for 48.29% of the variance) and negative emotion items (sad, anxious and angry) loading high on the other principal component (NE; accounting for 21.74% of the variance). Scales based on these items had acceptable reliability (PE α = .83; NE α = .77). Corresponding scales were created for problem specific emotions ratings.

Problem Discussion. For the diary, participants were asked a series of questions about the problem discussion they had that day. (1) How long did the conversation last (in minutes)? (2) How important is the problem to you? (3) How useful did you find this discussion. Participants responded to questions 2 and 3 on a 5-point Likert scale from 1 (not at all) to 5 (very). Participants were also asked with whom they discussed the problem and whether this person was male or female.

Problem Frequency. Participants were asked if they had discussed the problem with the same person before (yes/no) and, if so, how many times today, during the past week and the past month (giving a numerical response to each). Participants were also asked how many other people they had discussed the problem with.

Problem-specific Emotions. The mood scales (described above) were also presented a second time in the daily questionnaire, where participants were instructed

to indicate how they felt for each item when discussing the problem, on a 10-point Likert scale from 1 (not at all) to 10 (extremely). Participant were also asked to rate how having the conversation changed their mood in a positive direction and in a negative direction (on separate 10-point Likert scales; from 1, not at all, to 10, extremely). These scales significantly negatively correlated, $r(41) = -.35$, $p = .021$, and were therefore combined into one item.

Importance. Participants were asked to rate how important the problem was to them on a 5-point Likert scale from 1 (*not at all*) to 5 (*very*).

5.4 Results

Participants completed the diary on an average of 8 days ($M = 8.30$, $SD = 1.79$) out of 10, and reported problems on an average of 3 days ($M = 3.35$, $SD = 1.91$).

5.4.1 Correlations

Correlations between variables (CRQ, RRS, PA, NA, all taken pre-diary, and number of problems discussions reported[26]) were analysed.

[26] Due to missing data, and the fact that the majority of participants only reported one problem per problem day, the number of problems was the total number of problem days reported over the diary period. In this way, missing data was not as problematic because it was assumed that participants were less likely to complete the diary if they did not have a problem, and more likely to complete the diary if they did have a problem, meaning that all their problems should have been recorded across the 10 day diary period.

Table 9

Pearson's correlations (all *df* = 41) between CRQ, RRS, PA, NA, number of problems reported, PE and NE[27].

	CRQ	RRS	PA	NA	Number of problems	PE	NE
CRQ	1	.41**	.07	.33*	-.15	.09	.39*
RRS	.41**	1	.02	.66**	.14	-.23	.49**
PA	.07	.02	1	.08	-.07	-.01	.08
NA	.33*	.66**	.08	1	.03	-.23	.56**
Number of problems	-.15	.14	-.07	.03	1	-.17	-.02
PE	.09	-.23	-.01	-.23	-.17	1	-.24
NE	.39*	.49**	.08	.56**	-.02	-.24	1

(*) Indicates significance at the $p < .05$ level, (**) Indicates significance at the $p < .001$ level.

CRQ = Co-rumination; RRS = Rumination; PA = Positive Affect; NA = Negative Affect; PE = Positive Emotion; NE = Negative Emotion.

5.4.2 Conversation Measure Correlations

CRQ, RRS, PA, and NA did not significantly correlate with any of the measures relating to the problem reported on the selected problem day (importance of discussion, usefulness of discussion, length of discussion, thinking about the problem, and discussing the problem with others).

There were significant positive correlations for both males and females between the length of the conversation and how useful they found the conversation; $r(16) = .48$, $p = .043$, and $r(23) = .40$, $p = .048$, respectively. There were no other significant correlations between the variables for males or females.

[27] PE and NE were the averaged PE and NE scores across the problem and no-problem days for each participant.

5.4.3 Gender Differences

One-way ANOVAs revealed no significant gender differences for CRQ, F (1, 41) = 1.15, p = .290, η_p^2 = .027[28], RRS, F (1, 41) = 2.10, p = .155, η_p^2 = .049, PA, F (1, 41) = 0.70, p = .409, η_p^2 = .017, or NA, F (1, 41) = 0.52, p = .475, η_p^2 = .013. A Chi-squared test revealed that there was no significant gender difference in whether the person the participants discussed their problem with was male or female, χ^2 (1, N = 43) = 0.15, p = .697[29]. There were gender differences for the number of problem discussions reported, F (1,41) = 6.96, p = .012, η_p^2 = .145; females reported significantly more problems (M =3.96, SD = 2.07) than males did (M = 2.50, SD =1.29).

5.4.4 Daily reports of Positive and Negative Emotion

I conducted mixed-design ANOVAs on emotion ratings (general PE and NE) using problem (problem-day vs. no-problem-day) as a within-subjects factor and gender as a between-subjects factor. There were no significant effects in either analysis. Adding CRQ, RRS, and number of problems (over the diary period) separately as continuous independent variables to the general PE analysis revealed no significant effects. Confirming the results of the correlational analyses, corresponding analyses on NE scores revealed significant positive main effects of CRQ, F (1, 39) = 9.34, p = .004, η_p^2 = .193 and RRS, F (1, 39) = 15.20, p < .001, η_p^2 = .280. There were no other significant effects.

[28] Male CRQ (M = 2.57, SD =0.77), and female CRQ (M = 2.82, SD =0.76).
[29] The results indicated that 47% of participants discussed their problem with a man and 53% discussed it with a woman. For females, 44% of their problem discussions were cross-gender (with a man), and for males, 50% of their conversations were cross-gender (with a woman).

5.4.5 Emotional Effects of Problem Discussion

The problem-day scores were analysed alone (removing the no-problem-day data) to examine if there were any effects of gender on the additional variables which were only measured following problem discussions. A significant gender difference was found for length of conversation, with females reporting spending longer discussing problems (M = 22.71, SD = 16.49) than males (M = 10.61, SD = 7.57), F (1, 41) = 8.33, p = .006, η_p^2 = .172[30]. A gender difference was found for importance of the problem reported, females reported their problem as significantly more important (M = 4.56, SD = .58) than males did (M = 3.89, SD = 1.37), F (1, 42) = 4.84, p = .034, η_p^2 = .106. Univariate ANOVAs were also conducted to assess if there were any gender differences for problem-specific PE and NE. Only one gender difference was found for problem-specific PE, F (1, 41) = 16.77, p < .001, η_p^2 = .290; females reported significantly higher levels of problem-specific PE after discussing a problem (M = 2.29, SD = 1.68) than males did (M = 0.72, SD = 0.79). No gender differences were found for any of the other measures which specifically related to discussing problems. When CRQ and RRS were added to the univariate ANOVAs, separately as continuous independent variables, there were no main effects or significant interactions.

5.5 Discussion

As expected, co-rumination significantly correlated with rumination but did not significantly correlate with positive affect (PA) or number of problems. This was unexpected given the fact that co-rumination significantly correlated with PA in Studies 1 and 3. However, in keeping with Studies 1 and 3, self-reported co-

[30] One very high female outlier was excluded from the analysis (the conversation lasted 120 minutes which was twice as long as any of the other participants' conversations).

rumination (CRQ) did significantly positively correlate with negative affect (NA), and with negative emotion (NE). The coded co-rumination measure (CRQ) did not correlate with any of the problem measures (number of problems, importance of discussion, usefulness of discussion, length of discussion, thinking about the problem, and discussing the problem with others) which was surprising given that we would expect that there might have been positive correlations between some of these conversation variables and co-rumination; it would be reasonable to assume that those who co-ruminate may think about their problems more and discuss them more with others, but this was not found to be the case. It could be the case that the differences are small and therefore the results may reach significance if a larger sample were employed.

Surprisingly, there were no significant gender differences in self-reported co-rumination (CRQ), rumination (RRS), positive affect (PA), and negative affect (NA). We would expect from existing research and the research within this thesis that females would score higher on these variables (Rose et al., 2002; Rose et al., 2007). It was also unexpected that there was no gender difference in the effect of discussing the problem (i.e., change in mood). We might have expected women to feel worse after discussing a problem and we certainly might have expected an interaction between gender and co-rumination (co-rumination positively predicting worsening of mood for females) but this was not the case. The absence of gender differences could be due to the small sample size, or another explanation could be the fact that because participants recruited a friend of the opposite gender, it could be the case that they picked someone who has similar problem discussion style to them and therefore any gender differences were balanced because of the paired sample. Unfortunately, because of the recruitment process, I did not have the paired data to check if the self-

reported co-rumination scores (CRQ) of the pairs of friends correlated. The single-item measures of improving and worsening mood may not have been sensitive enough to detect gender differences. Alternatively, participants may have engaged in unnecessary conversations for the purposes of the study which did not affect their emotions to a great extent. Again it would be better to use a more reliable measure, such as the PANAS, to assess changes in emotion in future studies, and for this reason the PANAS was adopted for the two studies in the next chapter.

When examining the daily reports of general positive and negative emotion there were surprisingly few significant results. For the basic analyses of positive emotion (PE) and negative emotion (NE) there were no significant main effects or interactions. In addition, when the problem-specific emotion ratings (PE and NE) were analysed, the results, again, were limited. For PE and NE there was only one significant interaction which indicated that females reported greater problem-specific PE than males, after discussing a problem. This is in keeping with the self-disclosure literature which suggests that disclosing a problem will make the individual feel better (e.g., Brendgen et al., 2013; Turner, 1994). However there is no reason this should be the case for females but not males. As there was no interaction with the self-reported co-rumination measure (CRQ) when it was added to the analysis as a continuous independent variable, we cannot conclude that this effect was a result of co-rumination.

When co-rumination (CRQ), rumination (RRS), positive affect (PA), and negative affect (NA) were added separately to the general negative emotion (NE) analysis there were main effects of CRQ, RRS, and NA (but not PA), but there were no significant interactions. When CRQ, RRS, PA, and NA were added to the general

positive emotion (PE), problem-specific PE, and NE ANOVAs, there were no main effects or significant interactions. The lack of significant results is most likely due to the PE and NE measures that were used. For a more methodologically sound study it would be better to employ more reliable measures (such as the PANAS) rather than creating new measures. Although the positive main effects of CRQ, RRS, and NA, on NE are encouraging, they do not interact with gender or problem so they only tell us that, overall, people who are high on co-rumination, rumination, and negative affect, experience higher levels of negative emotion (sad, anxious, and angry). This does not completely fit with Rose's (2002; Rose et al, 2007) assumption that co-rumination only leads to negative outcomes for females (although no causality can be attributed in the current study), but does tie in with the previous observational and experimental research within this thesis which indicates that co-rumination can have negative outcomes for males as well as females, along with existing research which found no gender differences in negative outcomes (e.g., Hankin et al., 2010; White and Shih, 2012).

5.5.1 Methodological Problems and Directions for Future Research

This study was intended to be an exploratory investigation of CRQ's effects on affect over a 10-day diary period. The study has produced some interesting findings but is by no means exhaustive. One of the main issues with this study was that there was no stable daily measures of depression and anxiety. This was due to the set-up of the project in the current instance. Because of the need to keep the diary procedure manageable, I was not able to include lengthy measures such as the BDI-II, BAI, PA, and NA measures used in previous studies[31]. In the following two studies in this thesis

[31] In addition this study was conducted after the first observational study in this thesis so the results from studies 2 and 3 were not available to inform the methodology for the current study.

(Chapter 6) the daily-PANAS was adopted for comparability with the observational and experimental studies in this thesis.

The high levels of incomplete diary entries also posed a problem in the current study. A diary period of this length (10 days), conducted entirely online, was very difficult to monitor, especially since the participants were participating as part of a course rather than for payment. Therefore in the following two studies the diary was completed on paper, and submitted daily to the researcher, to ensure maximum completion of diary entries and the participants were given rewards for completion as encouragement. In addition, the 'number of problems' variable was limited because of the fact that participants rarely reported more than one problem per day, which meant that the aggregate number of problems over the diary period had to be used. Future diary studies may wish to include a measure which asks participants to state how many problem discussions they had that day. A further problem was the fact that participants were naturally discussing problems with friends of the opposite gender which reduces comparability with the previous studies in this thesis.

5.5.2 Conclusions

This simple study has allowed an initial insight into how co-rumination relates to daily problem discussions and mood. It was intended as an exploratory study and has provided valuable information about co-rumination's effects on the emotional outcomes of problem discussions. Although the analyses showed that gender and problem (problem day and non-problem day) had no effect on positive emotion (PE) and negative emotion (NE), it showed that CRQ was a significant negative predictor of NE. Future studies will need to adopt more reliable measures of positive and

negative affect and investigate whether co-rumination does lead to the negative effects suggested by Rose (2002; Rose et al., 2007) for females, males, or both.

6 CO-RUMINATION IN ADOLESCENTS DURING A DAILY DIARY STUDY

6.1 Abstract

The two studies in this chapter both investigate co-rumination in female adolescent samples using the diary method. The first study examines co-rumination in a sample of twenty 16-18 year old female students. Participants completed an 11-day diary procedure assessing positive and negative affect (using the PANAS). Participants were expected to experience higher levels of daily NA, and lower levels of daily PA, on high problem days than low problem days. I also predicted that CRQ would be a significant positive predictor of NA, and a negative predictor of PA, on problem days. Due to missing data, analysis focused only on high-, low- and non-problem days. The results indicated that NA was significantly higher on high problem days than on low problem days. CRQ was found to be a positive predictor of NA on non-problem days. The research was challenged by the small sample size and by the fact that the participants were away from home and therefore may have not been discussing problems in their natural style. The second study employed a much larger sample to investigate co-rumination in 11-16 year olds. Participants were asked to report details of their problem discussions, levels of affect (using the PANAS) and co-rumination (CRQ), every day for 5 days. It was expected that co-rumination would positively predict NA on problem days. The results indicated that although participants

experienced higher levels of NA on problem days than non-problem days, this was not related to their CRQ scores. However the daily measures of co-rumination that were used did show some relationship with PA and NA. Inclusion of male participants in similar diary research was suggested as the necessary direction for future research.

6.2 General Introduction

The findings of Study 4 indicated that there were very few gender differences in emotional outcomes during the 10-day period. Females did report significantly higher positive emotion about discussing their problems at the end of a day where they had a problem discussion (problem-specific PE), which is similar to the findings of Study 2 where females scored significantly higher on PA (at the two week follow-up compared with immediately after the conversation). In both studies an amount of time had passed after the discussion and the result from Study 4 seems to indicate that this increase in positive emotion can happen fairly quickly for females after a problem discussion and may be the reason why females engage in these dyadic interactions more than males do. However it should be noted that the two studies used different assessments of positive affect and therefore further research will need to explore the onset of positive affect after a problem discussion. It should also be highlighted that these findings were not as a result of co-rumination specifically but rather of general problem discussion (which may or may not involve co-rumination).

Study 4's results suggested that CRQ was a significant positive predictor of general negative emotion (not problem-specific negative emotion). It is disappointing that this finding was not for problem-specific negative emotion but it still suggests that co-rumination may be related to negative emotional outcomes. However the measure of

negative emotion was not a well-established measure, but rather one which was designed for that study. This weakness will be addressed in the current research where the PANAS will be used to assess changes in affect. The adoption of the PANAS in the current study will also allow for greater comparability with Studies 2 and 3, where the measure is employed.

None of the research presented so far in this thesis has addressed co-rumination in samples of children and adolescents. The two studies presented in this chapter aim to address this omission by investigating whether some of the effects found for females in the existing literature hold true in samples of female children and adolescents. The decision to use exclusively female samples was a practical decision in both studies based on access to appropriate samples; the use of psychology students in Study 5 meant that males were seriously under-represented (and the only two male participants were excluded in order to make the sample more homogeneous) and Study 6 was conducted at an all-girls school. However, as the negative effects of co-rumination that Rose (2002; Rose et al., 2007) suggested only apply to female participants, the research will still be of great interest, despite the lack of male participants to use as a comparison.

6.3 Study 5

6.3.1 Introduction

Like Study 4, Study 5 was intended to be an exploratory diary study of the effect of co-rumination. The sample however was of adolescent girls (aged 16-18) who were younger than Study 4's undergraduate participants. This potentially permitted

interesting comparisons between the two studies. The study lasted for 11 days[32] and it assessed changes in affect, along with details of any problem discussions and a measure of co-rumination (CRQ)[33]. Although there were interesting effects on the Negative Emotion variable in the previous research, I decided to use a more established measure in the daily diary in the current research. The PANAS was used because of its brevity and for consistency with the majority of the other studies within this thesis (Studies 2, 3, and 6).

The original co-rumination studies, conducted by Rose and her colleagues (Rose, 2002; Rose et al., 2007) investigated co-rumination using samples of children and adolescents, I felt it was important to conduct some research with these age groups for direct comparability with the existing research into co-rumination. However, samples of children and adolescents could not be used in the experimental and observational research in this thesis because of ethical issues associated with manipulating co-rumination in younger samples. Because the present research measures rather than manipulates variables relating to co-rumination, the same ethical issues do not arise. The existing literature indicates that co-rumination leads to depressive outcomes for female adolescents and I predicted that this relationship between co-rumination and negative affect would also be found in the current study (Hankin et al., 2010; Starr & Davila, 2009; Tompkins et al., 2011).

[32] This was the maximum number of days the participants were available to complete the questionnaire and 11 days were included, rather than the 10 from the previous study, to give maximum possibility given the volume of missing data in the previous study.
[33] Rumination was not included in the current research because of the desire to keep the questionnaire as brief as possible due to the limited time available to the participants in the evening.

6.3.1.1 Aims and Hypotheses

The aim of the current study was to investigate the effects of co-rumination on affect and problem discussion in a sample of adolescent females. The analyses compared participants' levels of affect on their highest problem day (day when the reported the most problems) with those on their lowest problem day. In addition their most important problem day was compared with their closest non-problem day. The effects of co-rumination were assessed using the CRQ. The findings will be directly compared to those from the adult sample used in Study 4.

Predictions were as follows:

1. CRQ will significantly positively correlate with (daily and trait) NA and negatively correlate with (daily and trait) PA.

2. Participants will experience higher levels of daily NA, and lower levels of daily PA, on high problem days than low problem days, and higher levels of daily NA, and lower levels of daily PA, on their most important problem days than on their non-problem days.

3. Participants will experience higher levels of daily NA, and lower levels of daily PA, on their high problem day than the day before or after it.

4. CRQ will be a significant positive predictor of NA, and a significant negative predictor of PA on problem days (both the highest problem day and the most important problem day).

6.3.2 Method

6.3.2.1 Participants

Participants were 16-18 year old female students (N = 20) attending a psychology class at a two-week summer school in Oxford. Participants' inclusion in the study was voluntary and they did not participate for course credit. The sample included students from 10 different nationalities. A requirement to be on the course was that the students have at least GCSE level written and spoken English skills; therefore there were no issues of linguistic competency.

6.3.2.2 Measures

Co-Rumination (CRQ; Rose, 2002). The original 27-item co-rumination questionnaire (Cronbach's $\alpha = .97$), taken at the end of the diary period, assessed participants' tendency to co-ruminate when discussing problems (Please refer to Chapter 4 for further details and to Appendix 1 for the full measure).

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). Participants completed two versions of the PANAS questionnaire; at the start of the study they completed a trait measure of how they generally felt (for each affect item) and participants also completed daily measures, for the duration of the study, which assessed how they were feeling each day. Participants completed the daily PANAS every day regardless of whether they had any problems to report (Please refer to Chapter 3 for further details).

Diary. The diary was designed to investigate daily emotions (using the PANAS, described above), what type of problems the participants were experiencing, and who they were discussing their problems with (please see Appendix 7 for the full

diary measure). Participants completed the same pen and paper diary every day for 11 days. Participants were asked to report if they had discussed a problem with anyone that day. If so, they completed further measures to assess what the problem was, and with whom they had been discussing it. If the participants had discussed more than one problem that day they were asked to report on their most important problem. Participants were also asked to rate how important the problem was to them and if discussing the problem made them feel better.

Demographic information. Participants were asked to indicate their gender and age.

6.3.2.3 Design

Repeated-measures ANOVAs were conducted with PA and NA as dependent factors, across three time points (day before, problem day, day after) and two levels (highest problem day / lowest problem day). The day before and after the problem days could have been problem days or non-problem days. In keeping with the previous diary study, and to compare problem days with non-problem days, the ANOVAs were also re-run with problem day at two time-points (most important problem day and nearest non-problem day; within-subjects).

6.3.2.4 Procedure

In their first class of the two-week Introduction to Psychology course, students were offered the opportunity to participate in the current study. They were informed that the study was not part of their summer school teaching and was not part of the course credit. Those who opted to participate were informed of their right to withdraw at any time during or after the study, and all individuals who volunteered to take part were

informed of what the study required and asked to sign an informed consent form. Participants were then asked to complete the CRQ and the trait PANAS measure. Once these measures were complete, the diary measure was distributed (each morning) and participants had the opportunity to ask questions. Participants then completed their diary every night for the next 11 nights. The diary was collected from each student the following day and the next diary sheet was given to them to complete that night. On the 12th day the final diaries were collected and participants were fully debriefed about the nature of the study. All students in the class were given confectionary at the end of the study for taking part.

6.3.3 Results

6.3.3.1 Correlations

There were no significant correlations between CRQ (M = 2.99, SD = 0.95), PA, or NA from the trait PANAS, number of problems discussed, or number of days they completed the questionnaire. Participants' CRQ scores did significantly positively correlate with their mean daily NA (over the number of days that they completed the daily PANAS), $r(18) = .48$, $p = .031$. The mean number of people the participants discussed their problems with also significantly positively correlated with the mean rated importance of their problem, $r(18) = .45$, $p = .047$ (over the number of days that they completed the daily PANAS). CRQ also significantly positively correlated with the mean NA score for non-problem days, $r(17) = .46$, $p = .046$. Trait NA significantly positively correlated with mean daily NA on both problem days, $r(18) = .47$, $p = .036$, and non-problem days, $r(17) = .60$, $p = .007$[34].

[34] Linear regressions using cross-product terms revealed that gender did not moderate any of the relationships between these variables.

6.3.3.2 Changes in Affect

Levels of missing data were high for many participants across the 11-day study. The mean number of days which participants completed was 9.75 (*SD* = 2.05), and the mean number of problems reported was 5.25 (*SD* = 3.09). Because of the variable response rate, analysis focused on selected days on which participants reported high or low numbers of problems. Similar day selection based on how many people the participants had discussed their problem with produced very similar results and will not be reported here for the sake of clarity.

To assess the simple main effects (below) each participant's data for their highest and lowest problem reporting days were analysed along with the day before and the day after these two occurrences[35]. The number of problems discussed on any one day ranged from 0 to 8. For the high problem days, the mean number of problems was 2.68 (*SD* = 0.73; Day Before, *M* = 1.26, *SD* = 1.97; Day After, *M* = 1.25, *SD* = 1.61) and for the low problem days the mean number of problems was 0.26 (*SD* = 0.73; Day Before, *M* = 1.26, *SD* = 1.33; Day After, *M* = 0.89, *SD* = 1.33).

A within-subjects repeated-measures ANOVA was conducted across three time points (non-problem day before, problem day, non-problem day after) and two levels (highest problem day / lowest problem day)[36]. When analysing PA, there were no main effects or significant interactions between time and level. Trait PA and NA, and CRQ score, were input as covariates but there were no main effects or significant interactions of interest.

[35] This was always the immediate day before and day after.
[36] Eight of the participants only had partial data (missing one or two data points).

When analysing NA, there was a main effect of level, $F(1, 30) = 6.03$, $p = .027$, $\eta_p^2 = .287$; NA was significantly higher in the high problem condition (M = 15.71, SD = 3.17) than the low problem condition (M = 14.21, SD = 2.98). Trait PA and NA, and CRQ score, were separately added to the analyses as continuous independent variables but there were no main effects or significant interactions of interest.

A simpler analysis was also conducted to avoid the problem of missing data for day before and/or day after highest or lowest problem days. In this analysis, participants' responses from their most important problem day were compared with their responses for the nearest non-problem day (counter-balancing half of the problem days before and half after, as in Study 4)[37]. There were no significant effects of day on either PA or NA. When CRQ was added to the PA and NA ANOVAs as a continuous independent variable, there was a significant interaction between day (problem or non-problem) and CRQ, $F(1, 16) = 19.61$, $p = .050$, $\eta_p^2 = .994$. CRQ was found to be a significant positive predictor of NA on non-problem days ($\beta = .54$, $r^2 = .29$, $p = .018$), but a non-significant predictor on problem days ($\beta = .29$, $r^2 = .08$, $p = .230$).

6.3.4 Discussion

The results from the correlations indicated that CRQ did not correlate with trait PA or NA which is surprising given that it correlated with both in Study 3 and correlated with trait NA in Study 4. However, CRQ did correlate positively with mean daily NA, but not PA, which is more in keeping with other findings reported in this thesis. This is consistent with the finding that CRQ was a significant positive predictor of daily NA on non-problem days (compared with most-important problem days), an

[37] Using a reduced sample of 19 participants due to the fact that one participant had indicated they had a problem on every day of the diary (and therefore had no non-problem day). For these 19 participants the data was complete.

intriguing finding given that we would expect that CRQ would predict daily NA on (most important) problem days when there is potential for co-ruminative activity to produce negative affect. However, as we have seen in Studies 2 and 3, co-rumination may not have an immediate negative effect so this change in NA may not manifest on the day. It is also possible that those who co-ruminate more feel worse in general, or that those who feel worse co-ruminate more. McLaughlin and Nolen-Hoeksema (2012) suggested that co-rumination could be support-seeking behaviour following rumination (which leads to negative affect) and this would certainly tie in with the current findings. However as there was no manipulation of co-rumination, we cannot attribute cause and effect.

There was also a significant positive correlation between the mean number of people participants discussed their problems with and the mean rated importance of the problems. This suggests that if a problem was perceived as more important it was discussed with more people (Rimé, 2009). Another possibility is that discussion with other people makes problems seem more important. Study 6 will assess whether this relationship depends on whether the problem discussions are co-ruminative. The expected effect on PA was not found, providing no support for co-rumination's specifically depressive effects (e.g., Hankin et al., 2010). Effects of CRQ on PA have been variable in previous studies too (e.g., females showed negative effects in Study 2 and positive effects in Study 3), and it seems likely that co-rumination operates differently across different contexts. Study 6 further investigates this relationship in a larger sample.

6.3.4.1 Methodological Issues and Directions for Future Research

Despite the limited sample size recruited for this study, it has led to some interesting findings. The hypothesis that CRQ would positively predict daily NA on problem days was not supported even though the age range of the present sample was closer to Rose's (2002; Rose et al., 2007) initial investigation than in Study 4. In addition, it was surprising that there was no interaction between time and level for positive affect or negative affect. I would have expected to see that participants would feel worse (higher levels of negative affect and lower levels of positive affect) on the day after a high-problem day. However there were some methodological problems with this study which may have contributed to these unexpected results. Firstly the small sample size may have led to some results not reaching significance or the fact that the participants may not have been in their normal environment. This issue will be addressed in the next study which employed a larger sample size. A more significant problem arises from the fact that the students were not in their usual home environment because they were visiting Oxford as part of a summer school. The lack of their ordinary social support (friends and parents) may have led to unusual patterns of behaviour which they may not have shown at home. Problems may not have been discussed normally, and it could be the case that they were unable to go through their normal pattern of emotional behaviour because they were distracted by the full table of activities and the new social environment they were experiencing. This could be one explanation as to why participants did not report feeling worse on the day after a high-problem day. Therefore the results from this study should be treated with caution. Study 6 avoids this problem by using boarding school students in their normal environment.

Missing data were again an issue in the current study despite the diaries being collected daily and the participants being advised to double-check their answers. It was unfortunate that the data which was missing was scattered throughout the diary entries (rather than for one or two participants), and the small sample size meant that the only way that the data could be analysed was comparing the data from problem and non-problem days (and high and low problem days). One reason for the missing data may be the duration of the study; participants may have become fatigued with the diary process over the 11 days. Therefore for Study 6, I reduced the duration of the diary to 5 days, which would still allow for the same comparison of problem and non-problem days but would hopefully reduce the amount of missing data (both for this reason, and the more practical reason of the restrictions imposed by the school timetable).

Studies 4 and 5 did not assess whether reported problem discussions were specifically co-ruminative. Study 6 includes measures designed to determine what kind of problem discussion occurred. This tightens the parameters of the study and allows for a more accurate assessment of whether co-ruminative conversations led to a change in affect. Studies 4 and 5 also failed to assess which of the nine criteria of co-rumination were present in each reported problem discussion. Study 6 therefore makes a preliminary attempt at evaluating the relative predictive capacity of these criteria on changes in affect

6.3.4.2 Conclusions

As predicted, NA was significantly higher on problem days but this effect did not depend on level of co-rumination. However co-rumination did significantly predict NA on non-problem days. This study therefore does not support the findings of the

experimental and observational research which suggested that co-rumination can lead to changes in positive and negative affect (albeit after a certain period of time has passed). However the findings do tie in with Study 4 which found very little emotional effect of co-rumination, only that is was predictive of general negative emotion (not problem-specific). Study 5 can be seen as a useful pilot study paving the way for Study 6. Study 6 corrects several issues with Study 5 (e.g., sample size and lack of direct measures of co-rumination). Study 6 uses a younger sample who may be compared with the older adolescents who participated in this study.

6.4 Study 6

6.4.1 Introduction

This study corrects some of Study 5's methodological problems. It was hoped that using a larger female sample, closer in age to Rose's (2002) original sample, would lead to a clear pattern of results. Study 6 also includes a more direct assessment of co-rumination, permitting me to differentiate between effects of general problem discussions and co-ruminative problem discussions. In particular, I predicted that co-ruminative tendencies as measured by the CRQ would moderate the effects of specifically co-ruminative problem discussions on affect. The lack of a measure of whether problem discussions were co-ruminative in Studies 4 and 5 may therefore explain why no such interactive effects were obtained.

As there is no existing measure of how to assess daily co-rumination, a one-item measure was developed for this study which briefly described what was involved in co-ruminative interactions and then asked participants to what extent they had discussed the problem in this way. It was hoped that this would provide a brief and accurate daily assessment of co-rumination (a more comprehensive 9-item measure

was also included for comparison). I predicted that this daily measure of co-rumination would positively correlate with the CRQ to confirm that it was assessing co-rumination on a daily basis.

A younger sample was employed in Study 6, allowing more direct comparability with Rose's (2002; Rose et al., 2007) original research. It is possible that the older samples used in Studies 1-5 of this thesis were more emotionally mature than the sample of 8-15 year olds used in Rose's studies and therefore more emotionally able to cope with potential negative consequences of co-rumination. However it was encouraging that some of the results showed the same patterns (some similar increases in NA and decreases in PA). Study 6 used schoolchildren aged 11-16 as participants; as previously mentioned, this age was chosen because it is the age that children start high school in the UK (age 11), whereas Rose used children who had just started middle-school in the USA (age 8). In keeping with Rose's findings (2002; Rose et al., 2007) I predicted age differences in the emotional outcomes of co-rumination. I expected that the adolescent groups (years 9 and 10; age 13-16) would experience more negative outcomes of co-rumination than the younger group (year 7 and 8 combined into one year group; age 11-13). This is because the younger group is closer in age to Rose's 'child' samples (2002; Rose et al., 2007) who did not report the same negative outcomes (for females) as the adolescent sample. I would expect to see these same negative outcomes of co-rumination for adolescents in the two older year groups (age 13-16).

The duration of the diary period in Study 6 was shorter than in Study 5 for both methodological and practical reasons. Practically, the schoolchildren were boarding at school during the week but then went home for weekends, meaning that any longer

period than 5 days would have included consecutive days in very different social contexts. An additional advantage is that missing data are likely to be less of a problem. In Study 5, participants had experienced fatigue (and had therefore left questions unanswered) over the longer period of the studies (10 and 11 days). Therefore it was decided that a shorter duration over which students could be supervised, and the completeness of their diary checked, was preferable.

Study 6's methodology was also tightened by using boarding school students in their natural environment. I conducted the study 9 months into the school year, so even first-year students were well adjusted to their daily routines. This was an improvement on the previous study which had used international students on a summer school, which could have affected their natural behaviour.

6.4.1.1 Aims and Hypotheses

The aims of the current study were to extend the findings of Studies 4 and 5 by using daily measures of co-rumination. The sample was more directly comparable to Rose's (2002) sample of females and adolescent children. The main aims were to investigate whether there was a relationship between the CRQ and the daily measures of co-rumination created for this study, and also whether co-rumination (daily and CRQ) led to negative changes in mood.

The following hypotheses were assessed in Study 6:

1. Daily co-rumination (problem-day CR and 9-item-CRQ) will significantly positively correlate with the CRQ.

2. As in previous studies CRQ will positively correlate with trait PA and NA.

3. Participants will report higher negative affect on problem-days than non-problem days.

3. 9-item-CRQ, problem-day CR, and CRQ will be positive predictors of NA on problem days but not on non-problem days.

4. Participants in the two older year groups (years 9 and 10) will experience significantly more negative affect as a result of co-rumination (on problem-days) than the younger year (a combination of years 7 and 8).

6.4.2 Method

6.4.2.1 Participants

Participants were 127 female boarding school students (aged 11-16; M = 13.80, SD = 1.10) who were recruited by year group. The four year-groups were grouped into three age categories; years 7 and 8 (ages 11-13) were grouped together because these were smaller year groups who were grouped together at the school (for study and boarding). The three age groups had very similar sample sizes: years 7 and 8 (N = 40), year 9 (N = 40), and year 10 (N = 47). All students had the opportunity to withdraw before, during, and after the study.

6.4.2.2 Measures

Co-Rumination (CRQ; Rose, 2002). The 27-item co-rumination questionnaire (Cronbach's α = .95) assessed participants' tendency to co-ruminate when discussing problems. Participants completed the CRQ on day 1 of their diary (after they had completed the daily diary element; Please refer to Study 3 for further details and to Appendix 1 for the full measure).

Positive and Negative Affect Scale (PANAS; Watson et al., 1988). Participants completed two versions of the PANAS questionnaire; at the start of the study they completed a trait measure of how they generally felt (for each affect item) and participants also completed daily measures for the duration of the study, which assessed how they were feeling that day. (Please refer to Study 2 for further details).

Diary. In addition to the daily PANAS, participants were asked to report how many problems they discussed that day (numerical response). If participants had discussed more than one problem they were asked to think of the most important problem to them and indicate how many people they had discussed it with (numerical response) and to state how important they felt the problem was to them on a 7-point Likert scale (from 1, not at all important, to 7, very important). Participants were also asked to indicate how discussing the problem made them feel, on a 7-point Likert scale (from 1, very negative / bad, to 7, very positive / good). Participants were asked to estimate how much they had been co-ruminating in accordance with the following statement: 'Sometimes when we talk about our problems we don't want our friends to help us solve the problem, sometimes we just want to tell our friends about the problem, tell them how it is making us feel, and talk about things that might happen because of the problem. How much do you think you have been discussing problems in this way today (compared with other normal days)?' Participants responded to this daily co-rumination item ('problem-day CR') on a 7-point Likert scale from 1 (not at all) to 7 (I have been doing this a lot). Participants were also asked to indicate which of the nine CRQ items (selecting as many of the nine items as were applicable) happened when they were discussing their problem (see 2.3.3 for details): (1) We talked about the problem over and over; (2) The other person tried really hard to get me to talk about the problem; (3) I tried really hard to get the other person to talk

about the problem; (4) We talked about parts of the problem we did not understand; (5) We talked about how the problem made us feel; (6) We decided not to do what we were planning to (for example, not doing your work) so we could talk about the problem; (7) We talked about the things which might have caused the problem (made it happen); (8) We talked about all the things that might happen after the problem (what other problems or things might happen because of this problem); (9) We have talked about this problem lots before. For each problem day the items were summed into one CRQ item ('9-item-CRQ').

6.4.2.3 Design

The participants completed a time-dependent diary every evening (at a time of their choosing, usually between 7 pm and 9 pm) for 5 days. If the participant had not discussed any problems that day then they were asked to complete the daily PANAS for that day (but not the rest of the questionnaire). Participants who had discussed no problems over the diary period, or discussed problems every day, were excluded from the diary analysis.

6.4.2.4 Procedure

Participants were recruited through an opt-out method in which the school, their parents, or they, could opt out of the study at any time. An information letter was given to, and read aloud to, participants before the study started, and there was an opportunity to ask any questions. Participants were all boarding students from school years 7-10. Participants completed their daily diary (on paper) during evening study (usually from 7 – 9 pm) every day for 5 days (Monday to Friday of one school week). Participants were allowed to approach the researcher to ask any questions they needed to, and all participants' diaries were collected from them at the end of their study

period or in their boarding area. Participants were fully debriefed about the nature of the study. Participants were rewarded with a special tea for their year group (not just those participating in the study) at the end of the study.

Due to the limited duration of the study (5 days), participants' most important problem day was analysed along with the closest non-problem day on which they completed an emotion rating[38]. The non-problem days were counter-balanced (half before and half after the problem day) to avoid any order effects[39]. Participants who did not complete more than one day of the diary, did not report any problems over the diary period, or who reported problems on every day, were excluded from the analysis comparing diary days, leaving a sample of 97 participants (28 participants in years 7 and 8, 33 in year 9, and 36 in year 10). Correlational analyses used the full sample of 127 participants[40].

6.4.3 Results

6.4.3.1 Correlations

Pearson's correlation coefficients revealed that CRQ (M = 2.88, SD = 0.71) significantly positively correlated with trait PA, $r(125) = .19$, $p = .038$, and trait NA, $r(125) = .24$, $p = .007$. CRQ significantly positively correlated with participants' average daily NA (averaged across the 5 days of the diary), $r(125) = .24$, $p = .007$, but not their average daily PA, $r(125) = .09$, $p = .343$. CRQ also significantly positively

[38] Although I had intended to include results where the participants' highest co-rumination day, lowest co-rumination day, and non-problem day were analysed, this led to an unfeasible reduction in sample size.

[39] An independent variable representing whether the non-problem day was before or after the problem had no significant effects when included in all the analyses of simple main effects (below), and so will be excluded from this presentation for the sake of clarity.

[40] The full sample was employed for the correlations to increase the statistical power of the analyses.

correlated with the total number of problems that participants reported discussing during the 5 days, $r(125) = .25$, $p = 005$.

Participants' trait PA significantly positively correlated with their average daily PA across the 5 day dairy, $r(125) = .75$, $p < .001$. Similarly, participants' trait NA significantly positively correlated with average daily NA, $r(125) = .75$, $p < .001$.

6.4.3.2 Conversation Measure Correlations

CRQ did not correlate with any of the conversation measures taken on the problem day (how many people they discussed the problem with, importance of the problem, or how the problem made them feel). PA significantly negatively correlated with how important the participants perceived the problem to be, $r(95) = -.27$, $p = .008$, and NA significantly positively correlated with importance, $r(95) = .30$, $p = .003$. Discussing how the problem made the participants feel significantly positively correlated with PA, $r(95) = .22$, $p = .031$, and significantly negatively correlated with NA, $r(95) = -.23$, $p = .022$. Problem-day CR significantly positively correlated with NA, $r(95) = .25$, $p = .013$ (there was no significant correlation for PA), how many people the problem was discussed with, $r(95) = .27$, $p = .008$, and importance, $r(95) = .41$, $p < .001$.

The nine items from the CRQ which were asked as part of the conversation measures were summed (9-item-CRQ)[41]. Pearson's correlations were run to analyse if the 9-item-CRQ variable correlated with the CRQ or the problem-day-CR item. The 9-item-CRQ item did significantly positively correlate with the CRQ, $r(95) = .21$, $p = .041$,

[41] The items were summed because co-rumination is a one-factor measure and therefore the more of the 9 characteristics the participant was exhibiting, the more they were co-ruminating.

but did not reach significance with the problem-day CR, $r(95) = .18$, $p = .071$[42]. The 9-item-CRQ item also significantly positively with NA, $r(95) = .23$, $p = .025$, but not with PA, $r(95) = .01$, $p = .094$.

6.4.3.3 CRQ Items and Affect

The 9-item-CRQ items were entered separately as independent variables into a linear regression to assess if any of the items were significant predictors of problem-day PA. None of the items were predictive of PA, but when the same regression was conducted for problem-day NA, items 2 and 5 were significant predictors (but not any of the other 7 items); 'the other person tried really hard to get me to talk about the problem' ($\beta = .22$, $p = .036$) and 'we talked about how the problem made us feel' ($\beta = .25$, $p = .022$).

6.4.3.4 Daily Reports of Positive and Negative Affect

I conducted a mixed-design ANOVA on emotion ratings (PA and NA) using problem (problem-day vs. no-problem-day) as a within-subjects factor and year (3 groups: 7 & 8, 9, and 10) as a between-subjects factor. The first analysis examined positive affect (PA) from the two reports. No significant main effects or interactions were found. A corresponding ANOVA was conducted on NA scores. There were main effects of problem, $F(1, 94) = 16.26$, $p < .001$, $\eta_p^2 = .147$, and year, $F(2, 94) = 3.76$, $p = .027$, $\eta_p^2 = .074$, however there was no significant interaction between the two. Participants reported significantly higher NA on problem days ($M = 19.50$, $SD = 7.54$) than non-problem days ($M = 17.04$, $SD = 6.03$). For year, there was a significant difference ($p = .008$) between year 1 (age 11-13; $M = 16.00$, $SD = 4.88$) and year 2 (age 13-14; $M =$

[42] There was also no significant correlation between the problem-day CR item and the conversation items from the CRQ (averaging the responses from questions 13-27, items 5-9, from the CRQ).

20.18, *SD* = 6.24), and a tendency towards a difference between years 1 and 3 (*M* = 18.64, *SD* = 6.47*; p* = .083), however there was no significant difference between years 2 and 3 (*p* = .287).

6.4.3.5 Co-rumination and affect

CRQ was added separately to the PA and NA analyses as a continuous independent variable. There were no significant effects. The 9-item-CRQ was also added separately as a continuous independent variable to the PA and NA ANOVAs, again there were no significant results for NA, but a significant interaction between problem and 9-item-CRQ was found for PA, $F(1, 91) = 8.87$, $p = .004$, $\eta_p^2 = .089$. Although linear regressions were non-significant, 9-item-CRQ was positive predictor of PA on non-problem days ($\beta = .16$, $r^2 = .03$, $p = .109$) and a negative predictor of PA on problem days ($\beta = -.14$, $r^2 = .02$, $p = .179$). However when the problem-day CR item was added to the analyses as a continuous independent variable there were no significant results for PA but there was a significant interaction for NA between problem and problem-day CR, $F(1, 91) = 4.18$, $p = .044$, $\eta_p^2 = .044$. Although linear regressions were both positive and non-significant, problem day co-rumination was a much stronger predictor of NA on problem days ($p = .082$) than non-problem-days ($p = .820$).

6.4.3.6 CRQ and Age

One-way ANOVAs were conducted to examine if there were any differences between the three year groups for each of the co-rumination measures (CRQ, problem-day CR, and 9-item-CRQ). There were no significant differences between the age groups for any of the three measures. Independent-samples t-tests were also conducted on CRQ scores across the 6 studies presented in this thesis. The data was divided into 3

groups: adult (Studies 1, 2, 3, and 4); older adolescent (Study 5); and younger adolescent and child (Study 6). The results revealed that there was a significant difference between the adult group and older adolescent group, $t(115) = -.2.27$, $p = .025$, and a significant difference between the adult group and the younger adolescents and child group, $t(289) = -.4.41$, $p < .001$. However there was no significant difference between the older adolescent group and the younger adolescent and child group, $t(115) = -.35$, $p = .727$[43].

6.4.4 Discussion

In the current study co-rumination (CRQ) correlated with both trait positive affect (PA) and negative affect (NA) as it did in Study 3, but not in Study 5 reported earlier in this chapter. This larger study lends support to the relationship between CRQ, PA, and NA. However, as in Study 5, CRQ was significantly correlated with daily NA but not daily PA. It is encouraging that in the two largest samples (in Studies 3 and 6) there are the same significant positive correlations between CRQ, PA and NA. When sample size is smaller the same correlations are not found, which is not surprising given the small effect sizes reported by Rose (Rose, 2002; Rose et al., 2007).

There was a significant correlation between co-rumination (CRQ) and the total number of problem discussions reported (positive correlation), which suggests that those who co-ruminate more discuss their problems more often. This is not surprising given that encouragement, by both members of the dyad, to discuss problems is a key part of co-rumination. However none of the other items (how many people they discussed the problem with, importance of the problem, or how the problem made them feel) correlated with co-rumination (CRQ). The more important the problem

[43] For the age analyses, all Levene's tests were non-significant therefore equal variances were assumed.

was the worse the participants felt, and the worse it made them feel the higher the levels of NA (and lower levels of PA) the participants reported. More interestingly, although there was no relationship between CRQ and the problem discussion measures, there were some correlations between the problem discussion measures and the problem-day CR item.

Problem-day CR significantly positively correlated with how many people the problem was discussed with (as was found with the CRQ) and how important the problem was perceived to be. This suggests that there is value in assessing co-rumination using a daily item. However, as the problem-day CR item only showed a tendency toward a significant correlation with the CRQ, it could be the case that the problem-day CR item was measuring something slightly different than the CRQ and this may explain why it significantly correlated with some of the problem discussion items but the CRQ did not. However the 9-item-CRQ variable did significantly positively correlate with the CRQ (but again, not the problem-day CR item), suggesting that using these 9 items may be a quicker way of assessing daily co-rumination than the CRQ. The problem-day CR and the sum CRQ items did significantly positively correlate with NA (but not PA) suggesting that there is a relationship between these items and the trait levels of anxiety reported by the participants. It could be the case that the problem-day CR item was not negatively focussed enough. We know from the regression analyses using the 9-item-CRQ items that focussing on feelings is predictive of negative affect (along with encouragement by their friend to discuss the problem) and from Study 3 that focussing on negative affect led to increased co-rumination in the co-rumination condition. Therefore, it

may be better in future studies to re-word the problem-day CR statement, focussing more on the negative elements of problem discussion[44].

It is encouraging that the two items which were significant predictors of NA in the regression analyses of the 9-item-CRQ items corresponded to the two ways in which I tried to manipulate co-rumination in the experimental studies (in Study 2 focussing on the friend encouraging their partner to discuss the problem, and in Study 3 by focussing on how the problem made them feel). This means that future studies can utilise these two elements of co-rumination (friend encouragement and focussing on feelings) to manipulate co-rumination. However, it would seem that in a controlled laboratory setting, focussing on (specifically negative) feelings might induce a co-ruminative discussion style more readily than encouragement by their friend.

In keeping with the previous two diary studies, there were no effects of day (problem or non-problem) on PA. It would seem that levels of happiness/depression do not depend on whether a problem has been discussed or not, but levels of anxiety do. In Studies 5 and 6 (but not Study 4), levels of negative affect were higher on problem days than on non- and low-problem days. The fact that having a problem and discussing it makes someone more anxious is not very surprising, but it is interesting that this has no effect on their levels of positive affect.

The lack of effect of co-rumination (CRQ) in the current study was disappointing, but there were significant interactions between problem-day CR and day (problem day and non-problem day) for negative affect (NA), and between 9-item-CRQ and day for

[44] For example, 'Sometimes when we talk about our problems we don't want our friends to help us solve the problem, sometimes we just want to tell our friends about the problem, tell them about how bad it is making us feel, and talk about all the negative things that might happen because of the problem. How much do you think you have been discussing problems in this way today'. (Please refer to 6.8.2 for the original item).

positive affect (PA). Although the linear regressions did not reach significance they indicated that the 9-item-CRQ was a near-significant positive predictor of PA on non-problem days and a near-significant negative predictor on problem days. In addition problem-day co-rumination was a much stronger non-significant predictor of NA on problem days than non-problem days. It is interesting that 9-item-CRQ was predictive of PA as there have been no (ANOVA) results which included positive affect in the diary studies. The result suggests that those who report greater co-rumination on problem days experience lower levels of positive affect (i.e., higher levels of depressive symptoms[45]), but that the opposite is true for non-problem days. This positive relationship between co-rumination and affect on non-problem days may help to explain why females continue to discuss problems in a co-ruminative way; if, on non-problem days (i.e., when they are discussing their friend's problems), co-rumination is a positive experience, this may get them into the habit of discussing problems in this way. Then when they do have problems, they naturally discuss them in a co-ruminative way, even though it may lead to decreased positive affect. It could also be the case that they do not associate the decrease in positive affect with the co-ruminative problem discussions they have had, and therefore still continue to discuss problems in this way.

The age range of the participants in this study also made it possible to add age (year) as a between-subjects factor in the analyses. There was a main effect of year on negative affect; there was a significant difference between the negative affect of year 1 and year 2 participants and a tendency towards a difference between year 1 and 3. However there was no significant difference between years 2 and 3. This would link

[45] As has been previously discussed, Watson et al. (1988) indicated that there was a significant negative relationship between the positive affect score and self-reported levels of depression, and also a significant positive relationship between the negative affect score and self-reported levels of anxiety.

somewhat with Rose's (2002) findings (she used 8-11 year olds in her 'child' sample and 12-15 in her adolescent sample), both years 2 and 3 in the current study would fall within the age range of her adolescent sample and year 1 (in this study ages 11-13) would be fall between the ages of her child and adolescent samples. The differences found in the current study can be explained by the transition from childhood (students in years 7 and 8 at school are still treated as children) to adolescence in accordance with Rose's (2002) account. This transition may be particularly salient for this sample because the participants' boarding school gave year 9 girls more responsibility, more privileges, and a different boarding area. This seems to be reflected in the way the children interact with each other (displaying more adolescent behaviours with regards to social interactions) and this may have impacted on their levels of negative affect. However as this did not interact with day (problem day or non-problem day) this could just be a reflection of more responsibility at school and the higher levels of negative affect that are widely reported in teenage years (e.g., Weissman & Klerman, 1977). Also as there were no effects of any of the CRQ items (CRQ, problem-day CR, or 9-item-CRQ), it is unlikely that these changes in affect were due to co-rumination. Further, it is noteworthy that there were no significant differences in CRQ scores between age groups in the present study.

When comparing the average co-rumination scores (CRQ) of this study with the CRQ scores across the previous 5 studies, there were significant differences between the scores of adults and older adolescents, and adults and younger adolescents / children, but no significant differences between older and younger adolescents / children. The results indicated that the older adolescent group scored highest on CRQ scores and there should be further investigation into this age group as there is very little existing research into co-rumination with adolescents aged 16-18.

6.4.4.1 Methodological Issues and Directions for Future Research

One of the methodological issues with this study was that the daily one-item measure of co-rumination may not have been accurately assessing co-rumination. However it does appear that the nine-individual items (summed) were, as these items significantly positively correlated with the CRQ. Therefore future research could amend the problem-day CR item to make it more negatively focussed and adopt the 9-item-CRQ to assess daily co-rumination.

The clear direction for future research is to conduct a similar study with a comparable male sample to permit investigation of gender differences. It was a significant drawback that these assessments could not be made in the current study due to the all-female sample. It would be interesting to examine if there are gender differences in this age group and what the emotional outcomes for males would be. From the experimental findings reported in this thesis we know that co-rumination does have emotional outcomes for males when it is manipulated, but it would be interesting to investigate their natural levels of co-rumination using more than just questionnaire data from one- or two-time-points (Rose, 2002).

The research is limited by the fact that details of the problems were not obtained. Due to the ethical considerations for a sample of this age I did not feel that it was ethically appropriate to ask participants for details of their problems, but obviously doing so might provide valuable insight into whether some sorts of conversations lead to increases in negative affect. It was also not ideal that the participants made their own personal assessments of whether their problem discussions were co-ruminative or not. A more methodologically complicated study could ask participants to sound record

their conversations so they could be coded for their levels of co-rumination, but this too would introduce ethical complications. This challenge of co-rumination assessment in these more vulnerable populations will need to be addressed by future researchers to enable them to accurately assess the effect of co-rumination. However, it is clear that diary research has provided some interesting extensions to the existing literature and that co-rumination cannot be completely assessed without using diary studies, or more intensive experimental research (with multiple experimental interactions), which would allow researchers to analyse co-rumination over time, rather than just as a single laboratory interaction.

6.4.4.2 Conclusions

To conclude, the current study demonstrates the value of including a daily assessment of co-rumination as both daily assessments within the current study had different effects on affect to the CRQ. There is a clear necessity for further diary research as there are clear differences between the emotional outcomes of co-rumination on problem and non-problem days, which should be investigated further. Future research should focus on sharpening the daily assessment of co-rumination by moving away from self-report and instead transcribing voice-recordings of daily conversations. However there are clearly methodological and ethical issues which need to be considered as the research into co-rumination progresses.

6.5 General Discussion

The two studies included in this chapter extended the adult research in chapter 5 using samples of adolescents and children. Study 5 was used as an initial investigation of the effect of the participants' co-rumination scores (CRQ) on their levels of affect, on

high and low problem days. The basic results from this smaller study indicated that participants experienced more negative affect on high problem days than low problem days and that co-rumination had minimal effects of affect (CRQ was a significant predictor of NA on non-problem days but not problem days). Similarly in Study 6, CRQ had no significant effects at all. However the larger investigation using children and adolescents did find significant effects of two new co-rumination items (9-item-CRQ and problem-day CR). The 9-item CRQ item had more of an effect on positive affect (PA), whereas the problem-day CR item had more of an effect on negative affect (NA). In both studies there was higher negative affect on problem days (high problem days in Study 5) than non-problem days (low problem days in Study 5) and there were more effects found overall for NA than PA. However there were methodological problems for both studies; Study 5 was limited by both the small sample size and the fact that there was no daily assessment of co-rumination. Although these problems were corrected in Study 6 there were still areas which could be improved across both studies. Both studies only assessed co-rumination in female samples and it would be of interest to investigate the outcomes, of Study 6 in particular, using a male sample, and allow for an investigation of gender differences. It would also enhance the current research if the measures were not only self-report but also that co-rumination could be assessed from audio or video recordings of problem discussions. Overall the two studies suggest that co-rumination (CRQ) does not have a large effect on the daily affective outcomes of co-rumination but that daily assessments of co-rumination (using the 9-item-CRQ and the problem-day CR measures) do seem to have an effect on reported affect.

6.5.1 Conclusion

These two studies have greatly contributed to the minimal existing diary literature into co-rumination in children and adolescents. Study 5 also examined an older adolescent sample which has not been investigated before in any co-rumination research. Not only do the studies present interesting findings about the effects of co-rumination on (particularly negative) affect, but they have also led to the development of two daily measures of co-rumination which can be used in future studies (9-item-CRQ and problem-day CR). The clear direction for future research is to examine similarly aged male samples so gender differences can be analysed. It is clear that the onset of puberty in adolescence is leading to changes in the emotional outcomes of problem discussion and further research will need to be conducted. It would be of interest for future researchers to investigate ways of conducting daily co-rumination research but also supplementing the self-assessment of co-rumination with independent ratings from a researcher. However there are methodological challenges which will need to be overcome to make this assessment possible; audio or video recording participants' problems (and transcribing them) is suggested as one possible solution.

7 GENERAL DISCUSSION

The research within this thesis has investigated co-rumination using observational, experimental and diary methods. These approaches to investigating co-rumination had been largely untouched by other researchers at the start of the project and therefore the research in this thesis was largely exploratory. This meant overcoming many methodological and theoretical challenges and has led to a thesis which is original and also makes a significant contribution to the co-rumination literature. As with any exploratory work there have been findings which are difficult to explain with reference to the limited existing research into the topic, and there have also been inconsistencies across some of the studies. However there are some very interesting insights which can be taken from this work, and these findings, along with a critical assessment of the research within this thesis, will be discussed in this chapter. Recommendations for the direction that co-rumination research should take in light of the findings from this research will also be presented, as will the issues that need to be addressed as research into co-rumination progresses.

7.1 Empirical Findings from the Research

7.1.1 Co-rumination Assessment

There are some encouraging findings from the three observational and experimental studies presented in this thesis (Studies 1, 2, and 3). In all three studies females scored higher than males on self-reported co-rumination (CRQ). Females also scored higher than males on coded co-rumination (CRCS) in two studies (1 and 2). These findings support existing research using the CRQ (Hankin et al., 2010; Jose et al., 2012; Rose, 2002; Rose et al., 2007; Tompkins et al., 2011). Also, moving beyond the existing research, Studies 2 and 3 found that there was a significant correlation between the co-rumination scores (CRQ) of the two members of each dyad. Although this correlation was non-significant in Study 1, this may have been due to the small sample size. These correlations are encouraging because they suggest that people have a joint co-ruminative style and that the CRQ is an accurate assessment of their co-rumination within that relationship.

There have also been some surprising findings as a result of the research. Notably, there was some inconsistency in the relationship between coded co-rumination (CRCS) and self-reported co-rumination (CRQ) scores. For Studies 1 and 3 there was no correlation between either member of the dyad's self-reported co-rumination scores (CRQ) and coded co-rumination scores (CRCS), and for study two, only the CRQ score of the person presenting their problem for discussion significantly correlated with the CRCS. These inconsistencies will need to be investigated further. It should be the case that the CRCS is, to some degree, a manifestation of the behaviour reported in the CRQ; however, on the whole, this was not the case, and this is supported by the differing effects that the CRQ and the CRCS had on affect (see

7.1.2 below). The instability in these findings may be to do with the small sample sizes used or possibly due to the fact that the CRCS was coded from videos rather than transcripts and this may have led to the raters being influenced by the facial expressions or tone of voice of the participants. For example part of the CRCS is to code how negatively focussed the participants are being and this could have been influenced by the participants' behaviour in the video, rather than the content of the conversation. It will be interesting for future researchers to investigate these discrepancies, coding the CRCS from the videos but also from a transcript of the conversation to examine if there are any differences. Another issue may be that the particular conversations sampled did not necessarily reflect the dyad's more usual co-ruminative style. Although participants did report across the observational and experimental studies that the conversations were natural and similar to the conversations they had in private, it would be more ecologically valid to sample several conversations and to ask participants to use audio recording in their own homes to gain insight into their natural discussion style.

7.1.2 Co-rumination and Affect

It was surprising that, even when the co-rumination manipulation was demonstrably successful in Study 3, this manipulation led to no consistent changes in reported affect (in all three conditions participants similarly reported higher negative affect (NA) after the experimental interaction). This would suggest that co-rumination did not have the effect on female participants' affect predicted by Rose (2002). However across the three studies there were some effects of, and interactions with, the co-rumination questionnaire (CRQ) and coded co-rumination scores from the experimental interactions (CRCS), which gave some insight into the relationship

between co-rumination and affect. The results indicated that the co-rumination score of the participant listening to their friend's problem (CRQ NP) was more predictive of anxiety symptoms (especially for males), whereas the co-rumination score of the participant presenting their problem for discussion (CRQ P) had effects on both depression and anxiety for both males and females. Overall, the coded co-rumination score (CRCS) was more predictive of depressive symptoms, especially for females. The diary studies in this thesis indicated that co-rumination was best assessed using daily items (9-item-CRQ and problem-day CR) which were more predictive of changes in positive affect (PA) and negative affect (NA) than the CRQ.

Due to the exploratory nature of this thesis, and the wide range of methods (observational, experimental, and diary), changes in affect were assessed using a variety of different measures, which were chosen because of their appropriateness for the methodology of each particular study[46]. Due to the diversity of the affect measures, there were predictable differences in the effects that co-rumination had on them. There were also some inconsistencies in the relationship between co-rumination (assessed using the CRQ) and the same measures of positive affect and negative affect (as assessed by the PANAS) that were used across different studies. However there were positive correlations between CRQ and PA, and CRQ and NA in the two largest studies in this thesis (1 and 6). The only studies in which the relationships were not significant (or near significant) were Studies 2 and 5, and given the smaller sample sizes of these studies it could be the case that the samples were not representative. For the first three studies co-rumination was also assessed using the CRCS and this meant

[46] Affect was assessed using one-item measures of happiness and calmness in Study 1, and the PANAS was used in studies 2, 3, 5, and 6. The BDI and BAI were used in addition to the PANAS in study three, and new variables assessing positive and negative emotion (PE and NE) were used in Study 4. Study 4 was actually conducted immediately after Study 1, and before the PANAS had been established as the main measure of affect for this thesis. PE and NE were used for their brevity and for the fact that individual items covered a small range of expected emotional outcomes.

that I could not only assess the association between participants' tendencies to co-ruminate (with their close friend) and affect, but also the association between their level of co-rumination in each conversation and affect. However, the associations between these two variables and affect, and their interactions with gender, were often quite different.

Coded levels of co-rumination (CRCS) had differing effects across the first three studies for males and females; in the first study there were no main effects of, or interactions with, gender (but there was a negative main effect of CRCS on happiness). For Study 2, gender and time moderated the effect of CRCS on PA (CRCS was a negative predictor of positive affect but only for females two-weeks after the experimental interaction; T4), and this was supported by the finding in Study 3[47] that CRCS was a significant negative predictor of BDI-II[48] for NP females (participants listening to their friend's problem) in the co-rumination condition at the two-week fellow-up (T4). In Study 3, CRCS also had a significant negative main effect on anxiety (BAI). These results demonstrate that the CRCS does affect both genders, but it also has specific effects on females alone. It also appears that across the studies CRCS is more closely related to depressive than anxious symptoms. However the negative main effect of CRCS on anxiety (BAI) found in Study 3 could demonstrate that anxiety (NA) was not being effectively measured by the PANAS in the previous studies, and it could be the case that co-rumination reduces anxiety (there were no effect of CRCS on NA to compare the BAI finding with). It should also be noted that these effects do not necessarily reflect a causal influence of co-rumination

[47] There were no effects of CRCS on PA and NA in Study 3.
[48] Low PA is related to depressive symptoms according to Watson et al., 1988b.

on affect since the findings are correlational and co-rumination (CRCS) was not manipulated.

However when examining the results from the CRQ, interestingly CRQ NP (the CRQ scores of the participants listening to their friends' problems) only appeared to have a positive effect on anxiety, and not on depressive symptoms[49]. This would make sense because we might expect that the reactions of our friend to our problems, especially if they are negatively focussed, might lead to increased anxiety. In addition it appeared that although there were some main effects of CRQ NP on anxiety for males and females, there were also several results that interacted with gender and were predictive of anxiety for males alone. In particular, CRQ NP was positively predictive of males' negative affect (NA) in Study 2 and males' anxiety (BAI) in Study 3. These male results are particularly interesting, due to the fact that negative effects of co-rumination were predicted only for females. It could be the case that a negatively focussed friend made them more anxious when they were encouraged to discuss problems in dyads, which is more non-normative for males. It would be very interesting to assess the effects of co-rumination on males' anxiety in a diary study (similar to Study 6 in this thesis). This type of study would also give us more insight into the day-to-day levels of co-rumination which males experience.

The effects of CRQ P (the CRQ score of the individuals presenting their problems for discussion) were more complicated. There were no effects of CRQ P in Study 1 but in Study 2 it was a positive predictor of negative affect (NA) for females at the two-week follow-up (T4). By contrast, CRQ P had a positive main effect on PA, and was a

[49] CRQ B was a negative main predictor of happiness (in conversation 1) in Study 1, however this effect on happiness may have been due to the fact that two conversations were being discussed and therefore all participants were presenting their problems and listening to their friends' problems.

significant positive predictor of PA at T4 in the co-rumination and solution-focussed conditions of Study 3. It also was a significant positive predictor of anxiety (BAI) for males and depression (BDI-II) for P males at the two-week follow-up (T4). It is unusual to have so many contradicting results for one variable across studies. Positive affect (PA) and negative affect (NA) were utilised in the studies because of their brevity and to maintain consistency but it would be more in keeping with existing co-rumination research to use the BAI and BDI-II measures to assess changes in depression and anxiety. It is interesting that CRQ P only predicted BDI-II and BAI scores for males, given that Rose's findings (2002; Rose et al., 2007) suggest that co-rumination should lead to negative outcomes for females but not males. It could be the case that those males who are high co-ruminators are more naturally depressed and anxious and that this manifested in the results. It would appear that the co-rumination score of the participant presenting their problem for discussion (CRQ P) was a significant positive predictor of depression (BDI-II) for males presenting their problem for discussion (P males) at the two-week follow-up (T4) suggesting that high co-ruminators who present their problems for discussion are more likely to be depressed two weeks after the interaction. From the existing research we would have expected this for females but not for males. This research clearly demonstrates that the negative outcomes of co-rumination do not apply exclusively to females and that male co-rumination should certainly be taken into account and investigated further. In addition it is also clear that co-rumination is having more of an effect at the two-week follow up (T4) than immediately after the conversation (T3). Therefore it could be the case that there are follow-up processes after the problem discussion which lead to increased levels of negative affect and these should be investigated using a daily assessment of related items (e.g., co-rumination, rumination, general problem

discussion) after the experimental interaction to examine if the effects are stronger in the days immediately after the interaction. In this way researchers will be able to gain a more precise insight into the changes in affect after the experimental interaction.

The findings from the diary studies suggest that co-rumination (CRQ) had very little effect on problem-specific emotions; the only significant finding of interest was that co-rumination (CRQ) had a significant positive main effect on negative emotion (NE) in Study 4, however this was not the case for problem-specific negative emotion. In Study 5, co-rumination (CRQ) was a significant positive predictor of negative affect (NA) on non-problem days, and in Study 6 co-rumination (CRQ) had no significant effects on positive affect (PA) or negative affect (NA). This was unexpected as it should be the case that co-rumination (CRQ) predicts levels of affect on problem days; however it seemed to be the case that the CRQ measure was too general to predict changes and that the daily assessments of co-rumination were more relevant to variations in affect over time. The 9-item-CRQ was a positive predictor of PA on non-problem days and a negative predictor on problem days. Similarly problem-day CR was a much stronger predictor of negative affect (NA) on problem days than non-problem days. These results show the value in using daily assessments of co-rumination to examine changes in affect and further diary research should be conducted on adolescent samples including male participants to examine what effects daily co-rumination has on the levels of affect reported by adolescent males.

Overall the findings from this thesis indicated that experimentally manipulated co-rumination had no effect on the reported levels of positive and negative affect but also that the gender differences which Rose (2002) suggested would result from co-rumination (increases in negative affect only for females) do not seem to occur.

Although there are some gender differences in the relationship between co-rumination (CRQ and CRCS) and affect for males and females (as discussed above), the results still indicated that there was a relationship between co-rumination levels and the negative affect experienced by males after the experimental interaction. Therefore it seems that there is a discrepancy between the existing questionnaire-based co-rumination literature and the findings of this thesis, which do suggest that co-rumination does have an effect on affect (mainly anxiety levels) for males. The lack of gender differences in the majority of the findings from the mixed-gender samples in these studies do suggest that there are negative effects of co-rumination for males as well as females; however this is not wholly surprising given that several pieces of existing literature also did not find gender differences (e.g., Hankin et al., 2010; Stone et al., 2010). The extent to which these gender differences are present in naturally occurring co-ruminative episodes (rather than ones which have been experimentally manipulated) will need to be determined by future researchers.

7.1.3 Closeness

Closeness was investigated in the observational and experimental studies in this thesis because Rose (2002; Rose et al., 2007) had suggested that co-rumination led to closeness for males and females and that this may help to explain why females still co-ruminated even though co-rumination also led to increased levels of depression and anxiety. However, effects of co-rumination on closeness have been under-investigated by subsequent researchers and the present research sought to remedy this using dyadic methods. However there were methodological problems with the assessment of closeness in Study 2 (closeness was not assessed in Study 1); closeness levels were unexpectedly very high and this meant that increases in closeness were

hard to detect. This problem was rectified in Study 3 by including additional measures of closeness. The results of Study 3 indicted that there were main effects of time, participants felt closer after the experimental interaction than before it (for closeness and the Inclusion of the other in the self scale; IOS), but there was no interaction with condition. This was disappointing as, according to Rose's research (2002; Rose et al., 2007), participants should have felt significantly closer following a co-ruminative conversation. However, Rose's findings may simply have been as a result of self-disclosure, which is strongly linked to co-rumination, rather than as a result of co-rumination itself, and therefore this would not have manifested in Study 3 (where all three conditions involved self-disclosure). It could also be the case that co-rumination only leads to increased closeness after a series of co-ruminative interactions and not just after one co-ruminative discussion. However it was encouraging that the coded co-rumination score (CRCS) was a positive predictor of closeness (in the no CR condition in Study 2 and for participants presenting their problem for discussion [P participants] in Study 3). There were also no gender differences reported for effect of the experimental interaction on closeness, which suggests that problem discussion (at least) does lead to increased closeness for males and females, however we cannot be sure of the effect of co-rumination in particular because it had very little effect on closeness in the experimental studies. The relationship between co-rumination and closeness will need more investigation using dyadic data from studies which analyse multiple co-ruminative interactions between pairs of friends.

7.1.4 Rumination and Co-rumination

Across the observational and experimental studies rumination had surprisingly little effect. It did significantly correlate with co-rumination in Studies 1, 3 and 4 (but not

in Study 2) but it did not have a main effect on, or interact with, other variables at all in Studies 1 and 2. In Study 3, rumination was shown to be a possible mediator of effects of CRQ on PA and NA. This is in keeping with Rose's (2002) suggestion that co-rumination only leads to negative outcomes because of its shared variance with rumination. I expected that rumination would have much more of an effect on the changes in emotion reported across the studies but the lack of effects suggests that, at least when examining isolated interactions, there are not strong relationships between rumination and the changes in affect due to problem discussion. It seems logical that there should be rumination either prior or subsequent to a co-ruminative discussion and it could be the case that when problem discussions develop naturally (rather than being forced in a laboratory setting) rumination does have a larger part to play. Much of the existing research into co-rumination does not include rumination measures, but it would be interesting for future researchers to examine multiple co-ruminative interactions and assess levels of rumination before and after these discussions.

7.1.5 Dyadic Analysis of Co-rumination

Another original element of this thesis compared with the existing co-rumination research, was the decision to use dyadic data analysis including measures relating to both friends within each sampled dyad. Even the previous experimental studies using pairs of friends did not report any dyadic analyses of data. The dyadic approach allowed me to not only analyse the relationship between the co-rumination scores of each of the friends (as discussed above), but also to examine if there were different emotional effects dependent on who was presenting their problem for discussion.

As discussed above, the friends' co-rumination scores (CRQ) tended to correlate positively, and co-rumination scores of one member of the dyad often had an effect on

the emotional outcome (anxiety) of the other dyad member (in Studies 1, 2, and 3). For example, Study 1 found that the listener's co-rumination score (CRQ) negatively influenced the problem presenter's calmness. Across the three studies it was clear that not only the co-rumination score (CRQ) of the person presenting their problem for discussion was having an emotional impact, but also the CRQ score of the person listening to the problem. The results from Studies 2 and 3 in particular indicate that the CRQ score of the person listening to the problem had a significant effect on the anxiety of all males at the two-week follow-up (BAI in Study 3) and the six-month follow-up (NA in Study 2). This suggests that the level of anxiety experienced by males is related to the levels of co-rumination reported by the person they are discussing their problem with. Further, in Study 3 it seems that the CRQ score of the person presenting their problem for discussion had a main effect on positive affect (happiness / depression), whereas the co-rumination score (CRQ) of the person listening to the problem had a main effect on negative affect (NA), again supporting the relationship between the CRQ score of the 'listener' and the subsequent levels of anxiety. However, as with some of the findings for co-rumination and affect, the dyadic results were not always consistent across studies and will need to be clarified in research using more frequent assessments of co-rumination. It should be the case that participants' CRQ scores, which were amended to be friend-specific in this thesis, reflect the levels of co-rumination within the relationship, rather than participants' individual tendencies to co-ruminate. Therefore it is perceptions of shared style that were being assessed and, as previously suggested, the friends' scores significantly positively correlated in most instances. In addition, the interpretation of these effects is not straightforward when the CRQ scores of friends correlate with each other. The current sample sizes did not permit controlling for the other friend's

CRQ score in the same analysis. Future researchers can address this issue by using larger samples and Hierarchical Linear Modelling methods, which would permit assessment of independent effects of both partners' co-rumination (CRQ) levels in the same analysis. Dyadic analysis was not practically possible in the diary studies within this thesis, but would be worth pursuing in future research, because it would permit investigation of how much the friends do interact with each other, and co-ruminate, over a period of time, and the emotional impact this has on each of them.

7.1.6 Age Differences

Although the only age and co-rumination analyses that were included in this thesis produced non-significant results (Study 6), there are still some interesting insights we can draw from the different ages of the samples. The research reported in this thesis investigated co-rumination in samples of children, adolescents, and young adults (11-30), and several comparisons can be made across the samples. Although the mean co-rumination (CRQ) scores reported across the studies did not differ greatly (2.71-2.99), there was a significant difference between the adult and older adolescent samples, and a significant difference between the adult and younger adolescent / child samples. The highest scoring sample was that of the older adolescents, and it is interesting that there is no existing research which focuses exclusively on this age group. Rose's work (2002; Rose et al., 2007) also suggests that co-rumination is highest in adolescence, but her samples only measured co-rumination in teenagers up to age 15, and it would be valuable to examine older adolescent samples. Older adolescents spend more time in social groups and are given more responsibility for their own life choices and therefore may experience more problems. It is important to examine if co-rumination is increased in the age group and, if so, what emotional effect it has.

7.1.7 Manipulating and Measuring Co-rumination

Two of the experimental studies reported in this thesis attempted to manipulate co-rumination (Studies 2 and 3). Listener's encouragement was manipulated in Study 2 to try to facilitate a co-ruminative discussion style. In 50% of the trials, the friend of the person discussing their problem was asked (without the knowledge of their friend) to repeatedly encourage their friend to discuss the problem. However, the manipulation did not have the desired effect. In Study 3, both participants were asked to focus only on the negative aspects of the problem, and manipulation checks confirmed that this had the desired effect of increasing the levels of co-rumination in this condition, compared with the co-rumination levels in the solution focussed and control conditions. Considering the exploratory nature of this research, and given the fact that most co-rumination studies do not take this experimental approach, it is noteworthy that this work has produced an effective manipulation of co-rumination which can be used to encourage co-ruminative discussions in future experimental research. I also believe that the encouragement variable could still be used to manipulate co-rumination but that it was not appropriate for a laboratory study where the slightly forced nature of the conversation meant that participants were naturally inclined to encourage their friend, even without instruction to do so. If researchers were to conduct more longitudinal research into co-ruminative discussions (examining multiple conversations over time) then the encouragement variable could be used as a way of manipulating co-rumination in addition to the negative focus on emotions which has proved effective in this research.

Although the CRQ and the CRCS have proved to be useful tools for assessing co-rumination, a simple daily measurement of co-rumination was needed for the diary studies. The CRQ could not be used because it assesses co-rumination in general,

rather than daily co-rumination or the level of co-rumination in a specific problem discussion. Therefore two daily measures were designed (for Study 6) to assess how much the participants had been co-ruminating that day. The 9-item reduced version of the CRQ (9-item-CRQ) significantly correlated with the CRQ and the one-item co-rumination question (problem-day CR) showed a tendency towards a significant correlation. Therefore it was suggested that with minimal adaptation these shorter measures could be used in future research to assess the levels of co-rumination in individual discussions or as a daily measure.

7.2 Overall Theoretical and Methodological Considerations for the Current Research and Future Research

7.2.1 Samples

One factor that is worth considering in this research is that the type of people who volunteer for problem discussion studies may not be representative of the general population. It may be the case that those who volunteer may be very comfortable discussing problems and therefore do it frequently. This may skew the sample particularly for male participants, as they generally spend less time in dyads and more time in larger groups (Martin & Fabes, 2001). The solution would be to not divulge the nature of the experiment before participation, but this may result in participants feeling uncomfortable and not discussing their most salient and important problems. This was the deciding factor (to disclose the full nature of the research) for the studies within this thesis, but it would be advantageous if these problems could be overcome with a different sampling method. The diary research in Study 6 overcame this problem to some extent because, although participants could opt out of the study, very few did, and the whole year group was involved, which meant that participants who

may not have volunteered for the study were more confident to participate because their whole year group was also taking part. This grouping method and an opt-out system may be the best way to proceed; this could be done with adults in the workplace or social groups, and in schools for children and adolescents.

It is clear that there is a need for work with larger samples than was possible in this thesis. This is supported by the challenging variation in results which have been reported in this thesis. This is caused, in part, by the exploratory nature of the research, which addressed issues that had largely been untouched by other researchers at the start of this project. However the small sample sizes in some of the studies no doubt played a part in the inconsistency in some of the results. This is also reflected by the contradictory findings in some of the existing literature, which in some instances report gender differences in co-rumination and in some cases do not (especially in studies with small sample sizes). Therefore it is recommended that, when investigating co-rumination, researchers aim for simpler studies, which employ larger sample sizes, because it seems that the individual differences associated with co-rumination may be too great to gain consistency from smaller sample sizes.

The studies within this thesis employed a broad age range of participants (11-30) but the differing methodologies of the studies meant that direct comparisons were difficult. As has previously been discussed, under 18s were not used in the experimental research, because of the ethical implications, although this is clearly a direction future research will need to take (as adolescence is the main focus of co-rumination research). However it would also be advantageous to do more work specifically focussing on older adolescents as they reported the highest levels of co-rumination in this thesis. As previously discussed, Rose's (2002; Rose et al., 2007)

samples only included participants up to age 15 but the results of this thesis suggest the need for more work with the 16-18 year old population. However the study with an older adolescent population in this thesis only had a small sample, so further research will be needed to assess whether these high levels of co-rumination are present in the general population. It would also be of interest to investigate co-rumination in older adults. The existing research which uses this population (e.g., Haggard, Robert, & Rose, 2011) indicates that co-rumination does occur and it would be interesting to examine the differing coping strategies of this population and the adolescent group. In this way we could investigate preventative measures to stop co-rumination leading to depression. It could be the case that adults' perspective taking is much more advanced because of their greater life experience. If so, training in resilience and perspective taking for adolescents could reduce the impact of co-ruminative problem discussions and rumination. However more experimental research will need to be conducted into the emotional impact of co-rumination before preventative measures can be investigated.

7.2.2 Methodology

7.2.2.1 Length of Conversation

A drawback of the current experimental and observational research was the short amount of time permitted for problem discussion. Five minutes was chosen for practical reasons; both to reduce fatigue for the two conversations, and for ease of the video-cued recall procedure when used. As no previous studies have included the manipulation of co-ruminative interactions there was no baseline amount of time which had been tested. It may be the case that in real life-interactions the length of the conversation does make a difference. It could be that because of the 'mutual

encouragement' element of co-rumination that participants who co-ruminate talk about the problem for much longer than non-co-ruminative participants, and it may be this element of co-rumination which leads to depression and anxiety. The lengths of the conversations in the diary studies were unrestricted but co-rumination did not seem to be more associated with affect in these studies than in the observational and experimental studies (CRQ had very few effects on affect at all). In Study 4, where length of conversation was assessed, there was no relationship between length of conversation, and co-rumination or affect (assessed by positive emotion [PE] or negative emotion [NE]). However it is hard to draw conclusions across these methodologically different studies and in future studies, experimenters should either manipulate the length of problem discussions to examine their differing effects or add a length of conversation measure to a diary study (which assesses positive and negative affect more robustly than Study 4) to examine if the length of conversation has an effect on resulting depression and anxiety.

7.2.2.2 Assessing Multiple Co-ruminative Interactions

In addition to addressing the issue of length of conversation, it would also be advantageous to conduct research which either has multiple experimental interactions or a diary study which assesses the co-ruminative levels of all problem discussions over a long period of time. Clearly there are practical difficulties with both of these approaches, which is why they were not adopted for the exploratory research in this thesis. However approaching co-rumination in this way would clearly be advantageous. Using multiple interactions would allow researchers to examine the impact of co-rumination over time, or across different relationships. It is naïve to suggest that (in the majority of cases) there can be a great emotional impact from one

problem discussion, especially when this discussion was conducted in an unnatural laboratory environment. This may be a reason for the discrepancies in the results across studies because we, to a certain extent, do not know the full nature of the participants' behaviour before the experimental interaction or after it. A study with more experimental interactions (and assessments between them) may reduce these extraneous variables and make the emotional impact more salient. Another way of achieving this would be to use an event-dependent diary which tracked all problem discussions completed by participants. In this way, the researchers could build a fuller picture of who the participant was interacting with and how, and what percentage of their problem discussions were co-rumination. However this would clearly be a study which would take a great deal of commitment from participants and they would need to be compensated accordingly.

I also believe that we are still at the very beginning of this research into co-rumination and that it would be very valuable to do some qualitative interviews with children and adolescents to gain a richer insight into how they discuss problems and the impact this has on them. Although researchers can investigate this quantitatively, I feel that, especially with the changing role of social media (discussed below), it would be advantageous to discuss the emotional impact of problems with these age groups because what seems a trivial problem to researchers may be salient for their participants.

It would also be of interest to combine the experimental and the diary research. In this thesis, one methodological issue was the fact that the follow-ups (in Studies 2 and 3) were only immediately after the conversation and two weeks after the conversation. This meant that I was unable to identify when changes in emotion were occurring.

Potential effects operating during the days after the problem may have been missed because the emotional and behavioural (e.g., further discussing and thinking about the problem) impact of the discussion had faded after two weeks. Therefore daily assessments after a co-ruminative episode might provide a more accurate means of mapping any changes in emotion.

7.2.2.3 Participant Recruitment and the Problem Discussion Requirements

Although many of us experience problems which lead to negative mood from time to time, in most cases these types of problems do not occur regularly. Therefore when we conduct experimental interactions or do a short-term diary study, the majority of participants may not be experiencing any problems which they feel they need to discuss with others. The participants did indicate in the studies within this thesis that the problems they discussed were important to them. However, although we asked for ongoing problems, for many participants the discussed problem was not a new one. Participants may therefore have already gone through the process of problem discussion and experienced its emotional effects. It would be very challenging to get around this methodological issue; one option would be to create an emotionally salient problem, however this would clearly lead to ethical issues. Alternatively researchers could ask participants to discuss a problem which they had not discussed before, or could use longer durations of event-contingent diary reporting, allowing a greater possibility of sampling currently-occurring problems. Another option is to change the nature of the recruitment process and to advertise specifically for people who have just experienced a significant problem. However there would again be ethical issues relating to protection of participants from psychological harm. Future

researchers will need to address how they recruit participants and how they can ensure that the participants are having more naturally occurring problem discussions which they feel they want to have with their close friends. Researchers would then need to create ways in which they could manipulate co-rumination within these conversations.

7.2.2.4 Gender Differences in Diary Research and Cross-gender Friendships

A clear direction for future research would be to examine daily male co-rumination in a diary study (similar to Study 6). It is clear from the first three studies reported in this thesis that co-rumination is predictive of negative emotional outcomes for males as well as females and this should be investigated, especially in adolescence, using diary studies. In this way researchers would be able to assess how often male children and adolescents do co-ruminate and whether this has an effect on the depressive and anxious symptoms that they report. This research can then expand into experimental research with the same populations. However the ethical issues of manipulating levels of affect in these age groups will have to be considered.

Another direction which future researchers should explore is cross-gender friendships. Due to the exploratory nature of all of the research within this thesis, I used same-gender friendships in the experimental studies because there was less likelihood of romantic interest clouding the emotions resulting from problem discussion. However it is clear that individuals do discuss problems with their friends of the opposite gender, and that these friendships often have no romantic involvement. For the diary research in this thesis we did not specify that the problem discussions had to be with a person that was the same gender. Study 4 found no gender differences in whether the person they discussed the problem with was male or female, indicating that cross-

gender problem discussions do occur, with roughly half of the conversations being cross-gender conversations. There was no evidence of different emotional effects in comparison to same-gender problem-discussions.

Further investigation will need to determine the frequency of these cross-gender discussions and confirm their emotional outcomes. More comprehensive research could examine whether there are less negative outcomes from discussing problems with males because they are more solution focussed, or whether when males discuss problems with females, who may be more emotion focussed, this leads to greater negative affect for them (Billings & Moos, 1981). Once the effects of co-rumination in same-gender friendships have been more reliably established the natural direction for the research to take would be examining problem discussion, and then co-rumination, in cross-gender friendships.

7.2.2.5 Co-rumination in Relationships Over Time

Another problem with the snapshot of co-rumination taken by the studies within this thesis, and by previous research in this area, is that it does not examine the progression of relationships over time and how co-rumination may evolve within a relationship. It could be that the reported negative outcomes of co-rumination are a product of relationship breakdown (in that friendship) or of one friend's refusal to discuss a problem anymore. It may not be co-rumination itself which causes depressive outcomes but something to do with the impact that co-rumination has on a friendship. Rose (2002) indicated that co-rumination research is interesting because it examines negative affect as a result of seemingly healthy friendships, but we do not know whether co-rumination is a product of healthy friendships or whether it can have a negative impact on the relationship itself. It would be interesting to investigate

co-rumination across friendships in teenage samples, because friendships are often more volatile at this age, and investigate what part co-rumination plays in social support and also friendship breakdown.

In addition to the research needed on the progression of co-rumination throughout a friendship, we also do not have a clear understanding of whether a person has a co-ruminative style that they adopt with the majority of their friends or whether the co-ruminative style is a product of one particular friendship. This has been investigated preliminarily in this thesis and the results of Study 3 indicate that measures of friend-specific and general co-ruminative style were tightly intercorrelated. This suggests that participants' co-ruminative style generalises across their close friendships.

This thesis only focused on dyadic data from single friendships. In fact it is clear that people do not always discuss problems in dyads but often co-ruminate in larger groups. The frequency and emotional effects of these types of discussions will also need to be examined. Further, there is very little research into co-rumination in romantic relationships. It would be useful to investigate what impact co-rumination has in romantic relationships and whether this type of problem discussion leads to more negative affect for the members involved. However the CRQ would need to be slightly amended to assess these types of relationships because the items are more tailored to friendships. It would also be fruitful to see if co-rumination is predictive of relationship satisfaction in romantic relationships. Another interesting issue concerns whether discrepancies between romantic partners' styles of co-rumination with friends affect problem discussions within their relationship.

7.2.2.6 Rumination

It is clear (especially from the results of Study 3) that rumination plays a part in the emotional outcomes of co-rumination. However, the present research measured this variable using the RRS which assesses consistent tendencies to ruminate rather than rumination arising from particular problems or discussions of those problems. Future studies could profitably analyse rumination levels in the week subsequent to problem conversation to assess the relationship between observed co-rumination and subsequent rumination.

In the present research, subsequent thinking about and discussion of the problem had little effect at the two-week follow-up in the experimental studies but this could have been because two weeks was too long a period to pick up the changes in thinking about and discussing the problem. Even if the problem was thought about and discussed a lot in the few days following the experimental interaction, this may have seemed minimal in retrospect at the time of the two-week follow-up. Therefore, as has been previously suggested, a daily measure needs to be taken after the experimental interaction to really assess the impact that the problem discussion has on subsequent thinking about and discussing the problem. A daily measure could be created to assess how much the participants have been ruminating (e.g., how much have you been thinking about the problem by yourself today in a negative way?) analogous to the diary measure of co-rumination used in the present research. This would give researchers a more precise and effective way of assessing whether co-rumination leads to further rumination as McLaughlin and Nolen-Hoeksema (2012) suggest. It is important to investigate rumination alongside co-rumination as it is very likely that

the two processes are interlinked and that the negative outcomes associated with co-rumination are also a product of prior or subsequent rumination.

7.2.2.7 Social Media

Eventually future research into co-rumination must consider the impact that interacting on social media has on emotional outcomes. It is impossible to ignore the fact that so much of our communication now happens via social media and remote forms of communication (e.g., texts, email, Facebook, Twitter). It is especially important to investigate co-rumination on social media considering the fact that the main focus of the co-rumination research is into how adolescents communicate with each other. It is increasingly unrealistic to ignore these more modern forms of communication on which adolescents, in particular, are becoming more dependent. It will be of interest to examine how co-rumination occurs on these different media platforms and whether its impact is more severe because of the isolation (and lack of physical interaction) that can be experienced when using them. On the other hand it could be the case that the opposite is true, and because we are more connected to our social support network, we are more able to communicate with people who may offer solutions to problems rather than co-rumination. Once more research has been conducted into co-rumination and we can draw firmer conclusions about the emotional outcomes of co-rumination in face-to-face problem discussions, we can begin to consider these broader applications of the research.

7.2.2.8 Preventative Measures

Finally, future research into co-rumination should focus on preventative measures to guard against depression and anxiety. The original motivation for co-rumination research was to find an explanation for why female teenagers in seemingly

functioning and healthy friendships still reported high levels of depression and anxiety. It is clear that we should be working towards preventing these negative outcomes which may result from particular kinds of habitual problem discussion, if they are indeed having this effect. Training in resilience and perspective taking have already been suggested (above) as possible ways of preparing children for the problems that may occur in adolescence but this training would also benefit adolescents and adults who are experiencing negative affect from problem discussions. It will be useful to implement this preventative training as early as possible so that individuals do not get trapped in the negative spiral of anxiety and depression in their adolescence. Simply teaching children to be more solution focussed may be an easy preventative measure for the depression and anxiety associated with co-rumination.

To really understand co-rumination's clinical impact it will be important to investigate co-rumination in clinical samples. This was clearly beyond the remit of the exploratory work in this thesis, and it may be the case that there needs to be much more investigation into the outcomes of co-rumination in non-clinical samples before the research can be conducted on more vulnerable clinical populations. It will be of great interest to examine the natural levels of co-rumination amongst participants with clinical levels of depression and anxiety and also to examine what effect manipulating co-rumination may have on their experience of the disorders. However the first aim for co-rumination research after this thesis must be to continue the exploratory experimental work with larger samples to gain some stability in what the emotional outcomes of co-rumination are, before exploring the broader applications of the research which have been suggested in this discussion.

7.3 Conclusion

This thesis makes a significant contribution to the small amount of existing research into co-rumination. When my doctoral research began, there were no existing experimental or diary studies which examined gender differences in co-rumination. Although the co-rumination manipulation used in Study 3 had no effect on levels of affect there were some effects of, and interactions with, the co-rumination questionnaire (CRQ) and coded co-rumination scores from the experimental interactions (CRCS). The results indicated that CRCS was more predictive of depressive symptoms (especially for females) and CRQ NP (the co-rumination score of the participant listening to their friend's problem) was more predictive of anxiety symptoms (especially for males). The CRQ P score (the co-rumination score of the participant who was presenting their problem for discussion) had effects on both depression and anxiety for both males and females. The diary studies indicated that co-rumination was best assessed using daily items (created for those studies) which were more predictive of changes in positive affect (PA) and negative affect (NA) than the CRQ. Overall, the findings suggest that co-rumination does not only have negative outcomes for females and future studies should investigate the outcomes of co-rumination for males as well as females. The lack of effect that the co-rumination manipulation had could have been due to the older age of the (adult) sample, compared with the existing research for children and adolescents (e.g., Rose, 2002; Rose et al., 2007). Therefore future researchers will need to establish ways of ethically manipulating and assessing co-rumination in these younger age groups. More immediate future research should use diary methods to assess males' and females' reports of daily co-rumination (similar to Study 6 in this thesis). This would

not only allow the researchers to examine the frequency of daily male co-rumination but also the effect that it has on levels of depression and anxiety.

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Appendices

Appendix 1 - CRQ

Standard CRQ Instructions

Think about the way you usually are with your best or closest friends who are girls if you are a girl or who are boys if you are a boy and circle the number for each of the following statements that best describes you.

Amended CRQ Instructions

Think about the way you usually are with the person you are participating in this study with and circle the number for each of the following statements that best describes you.

---

1. We spend most of our time together talking about problems that my friend or I have.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

2. If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

3. After my friend tells me about a problem, I always try to get my friend to talk more about it later.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

4. When I have a problem, my friend always tries really hard to keep me talking about it.

1	2	3	4	5

Not At All True A Little True Somewhat True Mostly True Really True

5. When one of us has a problem, we talk to each other about it for a long time.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

6. When we see each other, if one of us has a problem, we will talk about the problem even if we had planned to do something else together.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

7. When my friend has a problem, I always try to get my friend to tell me every detail about what happened.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

8. After I've told my friend about a problem, my friend always tries to get me to talk more about it later.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

9. We talk about problems that my friend or I are having almost every time we see each other.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

10. If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

11. When my friend has a problem, I always try really hard to keep my friend talking about it.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

12. When I have a problem, my friend always tries to get me to tell every detail about what happened.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

When we talk about a problem that one of us has....

1. ... we will keep talking even after we both know all of the details about what happened.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

2. ... we talk for a long time trying to figure out all of the different reasons why the problem might have happened.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

3. ... we try to figure out every one of the bad things that might happen because of the problem.

1	2	3	4	5
Not At All True	A Little True	Somewhat True	Mostly True	Really True

4. ... we spend a lot of time trying to figure out parts of the problem that we can't understand.

1	2	3	4	5

Not At All True A Little True Somewhat True Mostly True Really True

5. ... we talk a lot about how bad the person with the problem feels.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

6. ... we'll talk about every part of the problem over and over.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

7. ... we talk a lot about the problem in order to understand why it happened.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

8. ... we talk a lot about all of the different bad things that might happen because of the problem.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

9. ... we talk a lot about parts of the problem that don't make sense to us.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

10. ... we talk for a long time about how upset is has made one of us with the problem.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

11. ... we usually talk about that problem every day even if nothing new has happened.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

12. ... we talk about all of the reasons why the problem might have happened.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

13. ... we spend a lot of time talking about what bad things are going to happen because of the problem.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

14. ... we try to figure out everything about the problem, even if there are parts that we may never understand.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

15. ... we spend a long time talking about how sad or mad the person with the problem feels.

1 2 3 4 5

Not At All True A Little True Somewhat True Mostly True Really True

Appendix 2 – Co-rumination Coding

Global Coding: Assigning Global Codes

Co-rumination is defined as talking extensively about problems with a relationship partner and is characterized by a) a large amount of time spent talking about problems, b) mutual encouragement of problem talk, c) rehashing problems, d) speculating about problems, and e) dwelling on negative affect (Rose, 2002).

The following four aspects of co-rumination were coded using the following 5-point Likert scale:

1: Not at all / very little
2: A little
3: A moderate amount
4: A lot
5: Very much

1) Mutual encouragement of problem talk : One or both members of the dyad keeps the problem talk going instead of talking about other issues. One or both may also try to the other to talk about the problem again after the topic has been switched.

Alice: We have been talking about this forever! Oh well, it's okay.
Jane: I know; it's important. So what happened with [the problem] yesterday?

2) Rehashing problems : One or both members of the dyad talks about the problems or parts of the problems over and over again.

Daniel: I mean I know I've said this already, but she freaking *stole* his wallet!!
Josh: Right, dude. She freaking stole it. And remember how she said she didn't do it?

3) Speculating about problems : One or both members of the dyad ponders the origins of the problem or parts of the problem, why people did what they did, what may happen as a result, etc.

Jennifer: Why do you think he did that? He can't be that mean.
Sarah: I don't know. I mean, maybe he was having a bad day?

4) Dwelling on negative affect : One or both members of the dyad focuses on the experience of negative emotions like feeling worried, nervous, irritated, sad, anxious, angry, depressed, low, scared, distressed, anguished, shameful, embarrassed, frustrated, etc.

Bill: It sucks man. It really sucks.
Henry: Seriously. You must feel like crap.

General Score

Additionally, a single co-rumination score was assigned to each dyad using the same Likert scale listed above. This score reflected the coder's general sense of the combination of the four aspect scores and also took into account the total time spent talking about problems.

Appendix 3 – Study 1 Questionnaire

Q1 Have you been in your current friendship for over six months? (Yes / No)

Q2 Please describe your relationship with your friend.

Answers (1- Extremely, 2- Very much, 3- A lot, 4- Moderately, 5- Just a little, 6- Very Little, or 7- Not at all)

- To what extent could you turn to this person for advice about problems?
- How hard do you need to work to avoid conflict with this person?
- To what extent could you count on this person for help with a problem?
- How upset does this person sometimes make you feel
- To what extent can you count on this person to give you honest feedback, even if you might not want to hear it?
- How much does this person make you feel guilty?
- How much do you have to 'give in' in this friendship? To what extent can you count on this person to help you if a family member very close to you died?
- How much does this person want you to change?
- How positive a role does this person play in your life?
- How significant is this friendship in your life?
- How close will your friendship be with this person in 10 years?
- How much would you miss this person if the two of you could not see or talk with each other for a month?
- How critical of you is this person?
- If you wanted to go out and do something this evening, how confident are you that this person would be willing to do something with you?
- How responsible do you feel for this person's well-being?
- How much do you depend on this person?
- To what extent can you count on this person to listen to you when you are very angry at someone else?
- How much would you like this person to change?
- How angry does this person make you feel?
- How much do you argue with this person?

- To what extent can you really count on this person to distract you from your worries when you feel under stress?
- How often does this person make you feel angry?
- How often does this person try to control or influence your life?
- How much more do you give than you get from this friendship?

Q3 Below are words that describe personality. Please rate how well each pair of words describes YOU.

Answers (1- Not at all like me, 2- Not like me, 3- Not much like me, 4- Neutral, 5- Somewhat like me, 6- Like me, or 7- Just like me)

- Extraverted, enthusiastic
- Critical, quarrelsome
- Dependable, self-disciplined
- Anxious, easily upset
- Open to new experiences, complex
- Reserved, quiet
- Sympathetic, warm
- Disorganized, careless
- Calm, emotionally stable
- Conventional, uncreative

Q4 Tell me a little about how you feel about emotions.

Answers (1- Strongly agree, 2- Agree, 3- Somewhat agree, 4- Neither agree nor disagree, 5- Somewhat disagree, 6- Disagree, or 7- Strongly disagree

- Everyone can learn to control their emotions.
- If they want to, people can change the emotions that they have.
- No matter how hard they try, people can't really change the emotions that they have.
- The truth is, people have very little control over their emotions.
- I can learn to control my emotions.
- If I want to, I can change the emotions that I have.
- No matter how hard I try, I can't really change the emotions that I have.

- The truth is, I have very little control over my emotions.

Q5 Please indicate your agreement with the statements below.

Answers (1- Strongly agree, 2- Agree, 3- Somewhat agree, 4- Neither agree nor disagree, 5- Somewhat disagree, 6- Disagree, or 7- Strongly disagree

- On the whole, I am satisfied with myself.
- At times, I think I am no good at all.
- I feel that I have a number of good qualities.
- I am able to do things as well as most other people.
- I feel I do not have much to be proud of.
- I certainly feel useless at times.
- I feel that I'm a person of worth, at least on an equal plane with others.
- I wish I could have more respect for myself.
- All in all, I am inclined to feel that I am a failure.
- I take a positive attitude toward myself.

Q6 People think and do many different things when they feel sad or depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

Answers (1- Almost never, 2- Sometimes, 3- Often, or 4- Always)

- think about how alone you feel
- think 'I won't be able to do my job if I don't snap out of this'
- think about your feelings of fatigue and achiness
- think about how hard it is to concentrate
- think 'What am I doing to deserve this?'
- think about how passive and unmotivated you feel.
- analyse recent events to try to understand why you are depressed
- think about how you don't seem to feel anything anymore
- think 'Why can't I get going?'
- think 'Why do I always react this way?'

- go away by yourself and think about why you feel this way
- write down what you are thinking about and analyse it
- think about a recent situation, wishing it had gone better
- think 'I won't be able to concentrate if I keep feeling this way.'
- think 'Why do I have problems other people don't have?'
- think 'Why can't I handle things better?'
- think about how sad you feel.
- think about all your shortcomings, failings, faults, mistakes
- think about how you don't feel up to doing anything
- analyse your personality to try to understand why you are depressed
- go someplace alone to think about your feelings
- think about how angry you are with yourself

Q7 Think about the way you usually are with the friend you are participating with in this study and select the answer that best describes you for each of the following statements.

Answers (1- Not at all true, 2- A little true. 3- Somewhat true, Mostly True, or 5- Really True)

When we talk about our problems...

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.

- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.
- When my friend has a problem, I always try really hard to keep my friend talking about it.
- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.
- We'll talk about every part of the problem over and over.
- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Q8 This scale consists of a number of words that describe different feelings and emotions. Read each item and then select the answer which applies to what extent you generally feel this way, that is, how you feel on the average.

Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5- Extremely)

Interested

- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

Q9 These items deal with ways you cope with the stress associated with problems in you life. There are many ways to try to deal with problems. These items ask what you've been doing to cope with problems in general. Obviously, different people deal with things in different ways, but I'm interested in how you've try to deal with problems. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not—just whether or not you're doing it. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

Answers (1- I haven't been doing this at all, 2- I have been doing this a little bit, 3-I have been doing this a medium amount, or 4- I have been doing this a lot)

I've turn to work or other activities to take my mind off things.

- I concentrate my efforts on doing something about the situation I'm in.
- I say to myself 'this isn't real.'
- I use alcohol or other drugs to make myself feel better.
- I get emotional support from others.
- I give up trying to deal with it.
- I take action to try to make the situation better.
- I refuse to believe that it has happened.
- I say things to let my unpleasant feelings escape.
- I get help and advice from other people.
- I use alcohol or other drugs to help me get through it.
- I try to see it in a different light, to make it seem more positive.
- I criticise myself.
- I try to come up with a strategy about what to do.
- I get comfort and understanding from someone.
- I give up the attempt to cope.
- I look for something good in what is happening.
- I make jokes about it.
- I do something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.
- I accept the reality of the fact that it has happened.
- I express my negative feelings.
- I try to find comfort in my religion or spiritual beliefs.
- I try to get advice or help from other people about what to do.
- I learn to live with it.
- I think hard about what steps to take.
- I blame myself for things that happened.
- I pray or meditate.

- I make fun of the situation.

Q10 For each statement, indicate how much the statement applies to how you have been over the past month.

Answers (1- Yes definitely, 2- Yes sometimes, 3 - No not much, or 4 – No not at all)

- I wake early and then sleep badly for the rest of the night.
- I get very frightened or have panic feelings for apparently no reason at all.
- I feel miserable and sad.
- I feel anxious when I go out of the house on my own.
- I have lost interest in things.
- I get palpitations, or sensations of 'butterflies' in my stomach or chest.
- I have a good appetite.
- I feel scared or frightened.
- I feel life is not worth living.
- I still enjoy the things I used to.
- I am restless and can't keep still.
- I am more irritable than usual.
- I feel as if I have slowed down.
- Worrying thoughts constantly go through my mind.

Q11 Please describe two recent problems that have occurred in your life. These should only be problems that have happened to (or were caused by) you rather than your friend in this study. However you must only select problems that you have discussed with this friend (over the past few weeks). For example a fight with a loved one; forgetting an important birthday; lying to your partner about something. Please only report on those events that you have actually discussed with your current study partner. Also, please indicate how long ago you discussed this event with your friend and whether you consider this problem to be solved or finished (even if the fact that it is solved/finished is not due to talking it through with your friend).

- Please describe Problem 1
- How long ago did this problem occur?
- How long ago did you discuss this problem with your friend?
- Do you consider the problem to be ongoing or finished/resolved?

- Please describe Problem 2
- How long ago did this problem occur?
- How long ago did you discuss this problem with your friend?
- Do you consider the problem to be ongoing or finished/resolved?

Q12 There are occasions when people try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make others feel worse (e.g. less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way someone else feels over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers (1- Not at all, 2- Just a little, 3- Moderate amount, 4- Quite a lot, or 5- A great deal)

- I gave someone helpful advice to try to improve how they felt
- I told someone about their shortcomings to try to make them feel worse
- I did something nice with someone to try to make them feel better
- I acted annoyed towards someone to try to make them feel worse
- I explained to someone how they had hurt myself or others, to try to make the person feel worse
- I discussed someone's positive characteristics to try to improve how they felt
- I was unfriendly to someone to try to make them feel worse
- I complained to someone about their behaviour to try to make them feel worse
- I made someone laugh to try to make them feel better
- I listened to someone's problems to try to improve how they felt
- I ignored someone to try to make them feel worse
- I spent time with someone to try to improve how they felt

Q13 There are occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make themselves feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way you feel over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers: (1- Not at all, 2- Just a little, 3- A moderate amount, 4, Quite a lot, or 5- A great deal)

- I looked for problems in my current situation to try to make myself feel worse
- I thought about my positive characteristics to try to make myself feel better
- I started an argument with someone to try to make myself feel worse
- I laughed to try to improve how I felt
- I expressed cynicism to try to make myself feel worse
- I thought about my shortcomings to try to make myself feel worse
- I did something I enjoy to try to improve how I felt
- I sought support from others to try to make myself feel better
- I thought about negative experiences to try to make myself feel worse
- I thought about something nice to try to make myself feel better
- I listened to sad music to try to make myself feel worse
- I thought of positive aspects of my situation to try to improve how I felt
- I avoided thinking about things to try to make myself feel better
- I hid my feelings to try to improve how I felt
- I wished I was someone else, to try to improve the way I felt
- I took my feelings out on others to try to improve how I felt
- I dwelt on thoughts and feelings to try to make myself feel better

Q14 To what extent have you felt the following over the last two weeks:

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry

- Guilty

Q15 Please choose the picture below which best describes your friendship.

Answers: (1-7; 1 being the least close and 7 being the closest)

Q16 What is you gender? (male / female)

Q17 What is your age? (in years)

Q18 What is your current relationship status? (Single/ In a stable relationship/ Married or in a civil partnership/ Widowed / Divorced)

Q19 What is your education level? (Up to age 16 or less/ Up to age 18 only/ Undergraduate/ Postgraduate)

Q20 What is your employment status? (In full-time education/ In part-time education/ Employed 1-15 hours per week/ Employed 16-30 hours per week/ Employed 30+ hours per week/ Currently unemployed/ Voluntary work/ Housewife/Househusband/ On disability benefits/ On Sick leave/ Retired)

Q21 How well do you know the friend that you are participating in this study with? (1- Hardly at all / 2 / 3 / 4 / 5 / 6 / 7- A lot)

Q22 How did you meet your friend?

Q23 How long have you known each other? (in years and months)

Q24 What type of problems have you discussed, in the past two weeks, with the friend you are participating in this study with?

(Relationships/ Friendship/ Financial/ Family/ Work related/ Embarrassing Problems/ Problems that make you anxious/ Problems that make you feel sad/ Other personal)

Q25 If you discuss these type of problems with another person other than the friend you are participating in this study with then please fill out the following (If not, please go to 'Are you a native English speaker?')

Q26 What is your relationship to this other person(s) with whom you discuss problems (e.g. your friend, your mother/father)?

Q27 Please describe what type of problems you discuss with this other person(s) (e.g. financial, relationship). If there are different people with whom you discuss different problems please summarise which person you discuss which type of problems with.

Q28 Are you a native English speaker? (Yes/ No - If not how many years have you live in an English speaking country?)

Q29 What is your race/ethnicity? (Asian - Pacific Islander/ Black - African/ Caucasian/ Hispanic/ Other -Multi-Racial- Decline to Respond)

Q30 In how many serious romantic relationships have you been, including any current relationship? (by serious we mean any romantic relationship lasting more than 6 months).

Q31 On a scale from 0-10, how experienced would you say you are in romantic relationships compared with others your own age? (Scale from 1, not at all, to 10 extremely experienced)

Q32 Who do you discuss relationship or romantic problems with? (e.g. friend/ mother/ father/ colleague)

Appendix 4 – Study 2 Questionnaire

T1- 24 hours before the experimental interaction

Q1 People think and do many different things when they feel sad or depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

Answers (1 – Almost never; 2- Sometimes; 3- Often; or 4- Always)

- Think about how alone you feel
- Think 'I won't be able to do my job if I don't snap out of this'
- Think about your feelings of fatigue or achiness
- Think about how hard it is to concentrate
- Think 'what am I doing to deserve this?'
- Think about how passive and unmotivated you feel
- Analyse recent events to try to understand why you are depressed
- Think about how you don't seem to feel anything anymore
- Think 'why can't I get going?'
- Think 'why do I always react this way?'
- Go away away by yourself and think about why you feel this way
- Write down what you are thinking about and analyse it
- Think about a recent situation, wishing it had gone better
- Think 'I wont be able to concentrate if I keep feeling this way'
- Think 'why do I have problems other people don't have?'
- Think 'Why can't I handle things better?'
- Think about how sad you feel
- Think about all your shortcomings, failings, faults, and mistakes
- Think about how you don't feel up to doing anything
- Analyse your personality to try to understand why you are depressed
- Go someplace alone to think about your feelings

- Think about how angry you are with yourself

Q2 Think about the way you usually are with the friend you are participating with in this study and select the answer that best describes you for each of the following statements.

Answers (1- Not at all true; 2- A little true; 3- Somewhat true; Mostly True; or 5- Really True)

When we talk about our problems...

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.
- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.
- When my friend has a problem, I always try really hard to keep my friend talking about it.
- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.
- We'll talk about every part of the problem over and over.
- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Q3 This scale consists of a number of words that describe different feelings and emotions. Read each item and then select the answer which applies to what extent you have been feeling that way today

Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5-Extremely)

- Interested
- Distressed
- Excited

- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

Q4 There are occasions when people try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make others feel worse (e.g. less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way someone else feels over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers (1- Not at all, 2- Just a little, 3- Moderate amount, 4- Quite a lot, or 5- A great deal)

- I gave someone helpful advice to try to improve how they felt
- I told someone about their shortcomings to try to make them feel worse
- I did something nice with someone to try to make them feel better

- I acted annoyed towards someone to try to make them feel worse
- I explained to someone how they had hurt myself or others, to try to make the person feel worse
- I discussed someone's positive characteristics to try to improve how they felt
- I was unfriendly to someone to try to make them feel worse
- I complained to someone about their behaviour to try to make them feel worse
- I made someone laugh to try to make them feel better
- I listened to someone's problems to try to improve how they felt
- I ignored someone to try to make them feel worse
- I spent time with someone to try to improve how they felt

Q5 There are occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make themselves feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way you feel over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers: (1- Not at all, 2- Just a little, 3- A moderate amount, 4, Quite a lot, or 5- A great deal)

- I looked for problems in my current situation to try to make myself feel worse
- I thought about my positive characteristics to try to make myself feel better
- I started an argument with someone to try to make myself feel worse
- I laughed to try to improve how I felt
- I expressed cynicism to try to make myself feel worse
- I thought about my shortcomings to try to make myself feel worse
- I did something I enjoy to try to improve how I felt
- I sought support from others to try to make myself feel better
- I thought about negative experiences to try to make myself feel worse
- I thought about something nice to try to make myself feel better
- I listened to sad music to try to make myself feel worse

- I thought of positive aspects of my situation to try to improve how I felt
- I avoided thinking about things to try to make myself feel better
- I hid my feelings to try to improve how I felt
- I wished I was someone else, to try to improve the way I felt
- I took my feelings out on others to try to improve how I felt
- I dwelt on thoughts and feelings to try to make myself feel better

Q6 To what extent have you felt the following over the last two weeks:

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry
- Guilty
- Emotionally drained
- Used up
- Burned out
- At the end of your tether

Q7 What is your gender? (male/ female)

Q8 How old are you? (18-40)

Q9 What is your current relationship status? (Single/ In a stable relationship/ Married or in a civil partnership/ Widowed / Divorced)

Q10 What is your education level? (Up to age 16 or less/ Up to age 18 only/ Undergraduate/ Postgraduate)

Q11 How well do you know the friend that you are participating in this study with? (1- Hardly at all / 2 / 3 / 4 / 5 / 6 / 7- A lot)

Q12 How close do you feel to this friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q13 How did you meet your friend?

Q14 How long have you known each other? (Less than 3 months; 3-6 months; 6 months - 1 year; 1-3 years; 3-5 years; over 5 years)

Q15 Are you a native English speaker? (Yes / No; If not how many years have you lived in an English speaking country)

Q16 What is your race/ethnicity? (Asian - Pacific Islander/ Black - African/ Caucasian/ Hispanic/ Other -Multi-Racial- Decline to Respond)

<u>T2 – Pre-conversation</u>

Q1 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel this way at this moment.

<u>Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5- Extremely)</u>

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

Q2 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel this way at this moment.

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious

- Calm
- Energetic
- Sluggish
- Angry
- Guilty
- Emotionally drained
- Used up
- Burned out
- At the end of your tether

T3: Post-conversation

Q3 How similar would you say this conversation was to conversations you usually have with your friend?

(1-not similar at all/ 2 / 3 / 4 / 5 / 6 / 7 – similar)

Q4 How natural would you say this conversation felt compared to conversations you usually have with your friend?

(1-not natural at all/ 2 / 3 / 4 / 5 / 6 / 7 – very natural)

Q5 How close do you feel to your friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q6 How important is the problem to you (the problem which you discussed with your friend)

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q7 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel this way at this moment.

Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5- Extremely)

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

Q8 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel this way at this moment.

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy

- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry
- Guilty
- Emotionally drained
- Used up
- Burned out
- At the end of your tether

T4 - 2 Week follow up

Q1 How close do you feel to your friend you completed the study with?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q2 How important is the problem to you (the problem which you discussed with your friend)

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q3 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you have been feeling that way today.

Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5- Extremely)

- Interested
- Distressed

- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid

Q4 How often have you thought about the problem (which you discussed with your friend in the lab) over the past two weeks when you have been by yourself?

(1 - Not at all / 2 – Once / 3 – Once a Week / 4 - Three to five times / 5 - Every couple of days / 6 – once a day / 7 - more than once a day)

Q5 How often have you discussed the same problem with the same friend over the past two weeks?

(1 - Not at all / 2 – Once / 3 – Once a Week / 4 - Three to five times / 5 - Every couple of days / 6 – once a day / 7 - more than once a day)

Q6 How often have you spoken to the same friend (in general) over the past two weeks?

(1 - Not at all / 2 – Once / 3 – Once a Week / 4 - Three to five times / 5 - Every couple of days / 6 – once a day / 7 - more than once a day)

Q7 How often have you discussed the problem with another friend or relative?

(1 - Not at all / 2 – Once / 3 – Once a Week / 4 - Three to five times / 5 - Every couple of days / 6 – once a day / 7 - more than once a day)

Q8 How close do you feel to your friend you completed the study with?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q9 If any, how many other people have you discussed this problem with (excluding your friend in lab and excluding any friend or relative that you have discussed above)

(1 / 2 / 3 / 4 / 5 or more)

Q10 Please describe whether the other people you discussed the problem with were friends or relatives and how often you discuss these sorts of problems with them. Also please rate your closeness to each of these friends/ relatives on a scale of 1 to 7 (1 being not close at all and 7 being very close).

Q11 The following questions relate to how you might try to influence the emotions experienced by your close friend you have described in a previous section. Read the instructions carefully and answer each question by ticking the appropriate boxes.

There are occasions when people try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make others feel worse (e.g. less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way someone else feels over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

<u>Answers (1- Not at all, 2- Just a little, 3- Moderate amount, 4- Quite a lot, or 5- A great deal)</u>

- I gave someone helpful advice to try to improve how they felt
- I told someone about their shortcomings to try to make them feel worse

- I did something nice with someone to try to make them feel better
- I acted annoyed towards someone to try to make them feel worse
- I explained to someone how they had hurt myself or others, to try to make the person feel worse
- I discussed someone's positive characteristics to try to improve how they felt
- I was unfriendly to someone to try to make them feel worse
- I complained to someone about their behaviour to try to make them feel worse
- I made someone laugh to try to make them feel better
- I listened to someone's problems to try to improve how they felt
- I ignored someone to try to make them feel worse
- I spent time with someone to try to improve how they felt

Q12 There are occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make themselves feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way you feel over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers: (1- Not at all, 2- Just a little, 3- A moderate amount, 4, Quite a lot, or 5- A great deal)

- I looked for problems in my current situation to try to make myself feel worse
- I thought about my positive characteristics to try to make myself feel better
- I started an argument with someone to try to make myself feel worse
- I laughed to try to improve how I felt
- I expressed cynicism to try to make myself feel worse
- I thought about my shortcomings to try to make myself feel worse
- I did something I enjoy to try to improve how I felt
- I sought support from others to try to make myself feel better
- I thought about negative experiences to try to make myself feel worse
- I thought about something nice to try to make myself feel better

- I listened to sad music to try to make myself feel worse
- I thought of positive aspects of my situation to try to improve how I felt
- I avoided thinking about things to try to make myself feel better
- I hid my feelings to try to improve how I felt
- I wished I was someone else, to try to improve the way I felt
- I took my feelings out on others to try to improve how I felt
- I dwelt on thoughts and feelings to try to make myself feel better

Q13 To what extent have you felt the following over the last two weeks:

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry
- Guilty
- Emotionally drained
- Used up
- Burned out
- At the end of your tether

Thank you for completing the questionnaire. You will shortly receive your RPS credits or your payment. Please contact the experimenter to arrange collection of payment if you did not give your bank details at the start of the study. You will shortly be e mailed a form detailing the full nature of the experiment. If you have any questions please do not hesitate to contact the experimenter (laura.taylor@psy.ox.ac.uk). You will receive a short follow up questionnaire in 6

months. Please ensure that you complete this as it is a key part of the study. If you believe that your email address may change between now and then please fill out an alternative in the box below.

T5 – 6-Month Follow-up

Q1 How close do you currently feel to the friend that you completed the initial study with?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q2 Who did the problem belong to? (You/ Your friend/ Both of us)

Q3 How important is the problem to you (the problem which you discussed with your friend)

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q4 Do you consider the problem to still be a problem? (Yes/ No)

Q5 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you feel that way generally.

Answers (1-Very slightly or not at all, 2- A little, 3- Moderately, 4- Quite a bit, or 5- Extremely)

Interested

Distressed

Excited

Upset

Strong

Guilty

Scared

Hostile

Enthusiastic

Proud

Irritable

Alert

Ashamed

Inspired

Nervous

Determined

Attentive

Jittery

Active

Afraid

Q6 The following questions relate to how you might try to influence the emotions experienced by your close friend you have described in a previous section. Read the instructions carefully and answer each question by ticking the appropriate boxes.

There might be occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions where the make themselves feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies in the PAST TWO WEEKS to influence the way you feel. It does not matter whether the strategies work or not, just the extent to which you used them.

Answers: (1- Not at all, 2- Just a little, 3- A moderate amount, 4, Quite a lot, or 5- A great deal)

- I looked for problems in my current situation to try to make myself feel worse
- I thought about my positive characteristics to try to make myself feel better
- I started an argument with someone to try to make myself feel worse
- I laughed to try to improve how I felt
- I expressed cynicism to try to make myself feel worse

- I thought about my shortcomings to try to make myself feel worse
- I did something I enjoy to try to improve how I felt
- I sought support from others to try to make myself feel better
- I thought about negative experiences to try to make myself feel worse
- I thought about something nice to try to make myself feel better
- I listened to sad music to try to make myself feel worse
- I thought of positive aspects of my situation to try to improve how I felt
- I avoided thinking about things to try to make myself feel better
- I hid my feelings to try to improve how I felt
- I wished I was someone else, to try to improve the way I felt
- I took my feelings out on others to try to improve how I felt
- I dwelt on thoughts and feelings to try to make myself feel better

Q7 There are occasions when we try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when we try to make others feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies in the PAST TWO WEEKS to influence the way that your friend (who you are completing this study with) felt. It does not matter whether the strategies work or not, just the extent to which you used them. To what extent have you felt the following over the last two weeks:

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry
- Guilty

- Emotionally drained
- Used up
- Burned out
- At the end of your tether

Thank you for completing this study. If you have still not collected your payment for the study please email laura.taylor@psy.ox.ac.uk to arrange a time to collect it. You will shortly be e mailed a second letter describing what the purpose of the study was and what the data will be used for. If you have any issues, problems or concerns then please don't hesitate to contact the primary

Appendix 5 – Study 3 Questionnaire

Screening

Please copy and paste your unique participant number here. It is in the original email we sent to you. The next couple of pages give you information on whether you are eligible for the study and what the study involves. Please read each page carefully and note down any details you feel are important. If you have any further questions please feel free to email the researchers (oxstudy@gmail.com) before you start the questionnaire.

Would you consider the person you are completing this study with a close friend? (Yes/ No)

If No Is Selected, Then Skip To Thank you for completing the informed...

Is this a friend with whom you would feel comfortable discussing your problems?

(Yes/ No)
If No Is Selected, Then Skip To Thank you for completing the informed...

Is English your common language with your friend? (Yes/ No)

If No Is Selected, Then Skip To Thank you for completing the informed...

Thank you for completing the informed consent form. I'm afraid that your answers indicate that you are not eligible to complete the study at this time. Please contact the researchers at laura.taylor@psy.ox.ac.uk for further information. Thank you for your participation. Please click onto the next window to confirm you have read this message.

OR if Yes

The study consists of 3 stages. After you have completed the remainder of questions on this link we will determine if you are eligible for the study. If both you and your friend are eligible you will both complete all 3 stages of the study:

Stage 1 - Online questionnaire

This questionnaire will take around 40 minutes and should be completed at least one week before you come into the lab for your joint session.

Stage 2 - Lab session (at the Department of Experimental Psychology, South Parks Road, Oxford)

You and your friend will both come into the lab for a 30 minute lab session where you will discuss a problem on camera and then complete two short questionnaires.

Stage 3 - Online questionnaire (2 weeks after the lab session)

You and your friend will both separately complete another online questionnaire two weeks after your lab session which will take around 10 minutes. Once this has been completed you will be sent payment (£15 each) or given 12 RPS credits.

Payment

Once you and your friend have completed all three stages of the study you will both be reimbursed for your participation. If you are completing the study for RPS credits you will be awarded 12 credits. If you are not an RPS student you will be paid £15 which you must collect in person after the two week follow up (or your friend can collect it for you). If you cannot collect the amount in person we are happy to pay you a £15 Amazon voucher which will be sent to you via email. Please let the experimenter know which you prefer when you come into the lab at Stage 2.

You will now be directed to fill in the online consent form (please note we will also ask you to fill in a paper copy of this at Stage 2 when you both come into the lab)

What you need to know before you complete the informed consent form:

Title of the Research: Discussing problems in friendships

Purpose of research: To investigate various processes involved in discussing problems in same-sex friendships.

Investigators: Miss Laura Taylor (Principal Investigator), Dr. Brian Parkinson (Supervisor), Dr. Gwenda Simons (Supervisor).

Confidentiality: Your answers will be treated with the strictest confidentiality, and you have been allocated your own participant number to ensure your input remains confidential. Not even your friend will be able to see your input. All your questionnaire data will be stored under a participant number in a secure computer database. The only time your name and your participant number were linked is in the initial email we send you to inform you of your participant number. Please note that we will make sure that this information is only stored for the duration of your participation (we need it to be able to send you follow up emails and questionnaires) but any connection between your email address and participant number will be destroyed afterwards thus maintaining your confidentiality.

Getting in touch: For any problems or if anything is unclear regarding the questionnaire, or the study in general, please contact: Laura Taylor (laura.taylor@psy.ox.ac.uk)

PLEASE NOTE: We are not healthcare professionals and cannot offer you professional advice on dealing with worrying issues. If you feel that you are worried beyond an acceptable level which starts to interfere with your life, please consider contacting your GP or a voluntary organisation such as the Samaritans.

By clicking onto the next window you are agreeing that you have read and understood this information. If you are in any doubt about the study or have any concerns then please contact the researchers on the email provided (above) before you continue.

STOP: PLEASE MAKE SURE THAT YOU CAREFULLY TICK EVERY BOX WHICH APPLIES TO YOU BEFORE CLICKING ONTO THE NEXT PAGE

Please read through the following statements, tick the box if you agree with a statement and if you have ticked every single box you can then proceed to the first part of the study. Please only tick the statements that you agree with, if you do not agree with a statement then please do not tick the box as this means you will not be eligible for this study. If you have any questions about any of the statements or any of the information you have received, please do not hesitate to ask (laura.taylor@psy.ox.ac.uk) before completing the form.

- ❑ I have read through the participant information and I understand the general procedure to be used in this study and the various types of data to be collected.
- ❑ I understand that I can withdraw from the study at any moment whilst the study is ongoing and that I can still withdraw my data within one month of the date that the study took place, provided I supply the researchers with my participant number. I understand that I will not be penalised for my withdrawal in any way.
- ❑ I understand how my data will be stored and what will happen with the data at the end of the project.
- ❑ I understand that only researchers involved with the research will have access to the data and raw material.
- ❑ I understand that the project has been reviewed by and has received ethics clearance through, the University of Oxford, Central University Research Ethics Committee.
- ❑ I have had ample opportunity to ask questions and I understand that I will be fully debriefed about any aspects of this study which were not fully disclosed before or during the experiment, at the end of the experiment.
- ❑ I do not have any history of depression or mental health problems (If you are unsure about this then please contact the researchers before completing the rest of this consent form)
- ❑ I understand that maintenance and confidentiality of information is subject to the normal legal requirements
- ❑ I agree to take part in this study

If (Count) Is Less Than 9, Then Skip To Thank you for completing the informed...

Thank you for completing the informed consent form. I'm afraid that your answers indicate that you are not eligible to complete the study at this time. Please contact the researchers at laura.taylor@psy.ox.ac.uk for further information. Thank you for your participation. Please click onto the next page to confirm you have read this message.

If (Count) is 9, Then skip to Thank you for completing the consent form

Thank you for completing the consent form. We will now ask you to complete a questionnaire to check your eligibility for this study.

Q1 What is your gender? (Male / Female)

Q2 How old are you? (You must be between 18 and 30 years old to take part in this study). Please contact the researchers if you do not meet the age requirements.

(Answer:18-30)

Q3 Please indicate your relationship status:

(Answer: Single / In a relationship - 6 months or less / In a relationship - more than 6 months / Married or in a Civil Partnership / Separated / Divorced / Widowed)

Q4 What is your current education level

(Answer: Up to 16 or less / Up to 18 only / Undergraduate / Post-Graduate)

Q5 How well do you know the friend with whom you are participating in this study?

(Answer: Hardly at all – 1 / 2 / 3 / 4 / 5 / 6 / Very Well – 7)

Q6 How close do you feel to this friend?

(Answer: Not close at all – 1 / 2 / 3 / 4 / 5 / 6 / Very close – 7)

Q7 How did you meet your friend?

(Answer: At School / At University / Other - please indicate)

Q8 How long How long have you known each other?

(Answer: 0 - 3 months / 3 - 6 months / 6 months - 1 year / 1 - 3 years / 3 - 5 years/ longer than 5 years)

Q9 Are you a native English speaker?

(Yes / No - If no, how many years have you lived in an English speaking country - please respond in digits only)

Q10 What is you race/ethnicity

(Answer: Asian / Pacific Islander / Black / African / Caucasian / Hispanic / Other or Multi - Racial / Decline to Respond)

Thank you for completing the general information about yourself. There is now only one more set of questions for you to answer before you will be able to start the study. Once you have completed this questionnaire you and your friend's eligibility for the study will be assessed and if you are both eligible you will be emailed the online questionnaire for Stage 1 of the study.

Q10 This questionnaire consists of 21 groups of statements. Please read each group of statements carefully and then pick the one statement in each group that best describes the way you have been feeling in the past two weeks, including today.

(All answers have their own set of responses, they are scored from 1- 4)

Sadness

(I do not feel sad / I feel sad much of the time / I'm sad all the time / I'm so sad and unhappy that I can't stand it)

Pessimism

(I'm not discouraged about my future / I feel more discouraged about my future in the past two weeks / I do not expect things to work out for me / I feel my future is hopeless and will only get worse)

Past Failure

(I do not feel like a failure / I have failed more than I should have / As I look back, I see my life as a series of failures / I feel I am a total failure as a person)

Loss of Pleasure

I get as much pleasure as I ever did from the things I enjoy / I don't enjoy things as much as I used to / I get very little pleasure from the things I used to enjoy / I can't get any pleasure from the things I used to enjoy)

Guilty Feelings

(I don't feel particularly guilty / I feel guilty over many things I have done or should have done / I feel quite guilty most of the time / I feel guilty all of the time)

Punishment Feelings

(I don't feel I am being punished / I feel I may be punished / I expect to be punished / I feel I am being punished)

Self-Dislike

(I feel the same about myself as ever / I have lost confidence in myself in the past two weeks / I am dissapointed in myself / I dislike myself)

Self criticalness

(I don't criticise or blame myself more than usual / I am more critical of myself than I used to be / I criticise myself for all of my faults / I blame myself for everything bad that happens)

Suicidal thoughts or wishes

(I don't have any thoughts of killing myself / I have thoughts of killing myself, but I would not carry them out / I would like to kill myself / I would kill myself if I had the chance)

Crying

(I don't cry more than I used to / I cry more than I used to / I cry over every little thing / I feel like crying but I can't)

Self-criticalness

(I don't criticise or blame myself more than usual / I am more critical of myself than I used to be / I criticise myself for all of my faults / I blame myself for everything bad that happens)

Agitation

(I am no more restless or wound up than usual / I feel more restless or wound up than usual / I am so restless or agitated that it is hard to stay still / I am so restless or agitated that I have to keep moving or doing something)

Loss of Interest

(I have no lost interest in other people or activities / I am less interested in other people or things in the past two weeks / I have lost most of my interest in other people or things / It's hard gaining interest in anything)

Indecisiveness

(I make decisions about as well as ever / I find it more difficult to make decisions than usual / I have much greater difficulty making decisions than I used to / I have trouble making any decisions)

Worthlessness

(I do not feel I am worthless / I don't think that I'm as worthwhile as useful as I used to / I feel more worthless as compared to other people / I feel utterly worthless)

Loss of energy

(I have as much energy as ever / I have less energy in the past two weeks / I don't have enough energy to do very much / I don't have enough energy to do anything)

Changes in sleeping patterns

(I have not experienced any change in my sleeping pattern / I sleep somewhat more OR less than usual / I sleep a lot more OR less than usual / I sleep most of the day OR I wake up 1-2 hours early and can't get back to sleep)

Irritability

(I am no more irritable than usual / I am more irritable than usual / I am much more irritable than usual / I am irritable all the time)

Changes in appetite

(I have not experienced any change in my appetite / My appetite is somewhat less than usual OR My appetite is somewhat greater than usual / My appetite is much less than usual OR My appetite is much greater than usual / I have no appetite at all OR I crave food all the time)

Concentration difficulty

(I can concentrate as well as ever / I can't concentrate as well as usual / It's hard to keep my mind on anything for long / I find I can't concentrate on anything)

Tiredness or fatigue

(I am no more tired or fatigued than usual / I am more tired or fatigued more easily than usual / I am too tired or fatigued to do a lot of things I used to do / I am too tired or fatigued to do most of the things I used to do)

Loss of interest in sex

(I have not noticed any recent change in my interest in sex / I am less interested in sex than I used to be / I am much less interested in sex now / I have lost interest in sex completely)

Thank you for completing the consent form and questionnaires. The experimenters will now assess whether you and your friend are eligible for this study. You should receive an email within the next 24 hours (once both of you have completed this questionnaire) stating whether you are eligible or not for this study. If you have any questions or have had any problems completing this questionnaire please contact the

researchers (oxstudy@gmail.com). PLEASE CLICK ONTO THE NEXT PAGE TO CONFIRM YOU HAVE READ THIS MESSAGE

(T1)

Thank you for completing the initial questionnaire. Your results indicated that you are eligible for this study. Please complete the following questionnaire on your own and please do not discuss your answers with your friend. We have found that this questionnaire usually takes around 30 minutes. Please make sure you have time to do this undisturbed and that you take the time to read each of the questions carefully before you answer. Once you have completed the questionnaire you will be able to book a time to come into the lab and complete the next part of the study.

Please enter your unique participant number here. It is in the original email we sent to you.

Q1 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Indicate to what extent you have been feeling that way today

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous

- Determined
- Attentive
- Jittery
- Active
- Afraid
- Depressed

Q2 Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past two weeks, including today, by marking the appropriate answer.

Answer: (Not at all / Mildly, but it didn't bother me much / Moderately - it wasn't pleasant at times / Severely - it bothered me a lot)

- Numbness or tingling
- Feeling hot
- Wobbliness in legs
- Unable to relax
- Fear of worst happening
- Dizzy or lightheaded
- Heart pounding/racing
- Unsteady
- Terrified or afraid
- Nervous
- Feeling of choking
- Hands trembling
- Shaky / unsteady
- Fear of losing control
- Difficulty in breathing
- Fear of dying
- Scared
- Indigestion
- Faint / lightheaded
- Face flushed
- Hot / cold sweats

Q3 The following questions relate to how you might try to influence the emotions experienced by your friend who you are participating in this study with. Read the instructions carefully and answer each question by ticking the appropriate boxes.

There are occasions when people try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make others feel worse (e.g. less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way someone else feels over the past two

weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers (1- Not at all, 2- Just a little, 3- Moderate amount, 4- Quite a lot, or 5- A great deal)

- I gave someone helpful advice to try to improve how they felt
- I told someone about their shortcomings to try to make them feel worse
- I did something nice with someone to try to make them feel better
- I acted annoyed towards someone to try to make them feel worse
- I explained to someone how they had hurt myself or others, to try to make the person feel worse
- I discussed someone's positive characteristics to try to improve how they felt
- I was unfriendly to someone to try to make them feel worse
- I complained to someone about their behaviour to try to make them feel worse
- I made someone laugh to try to make them feel better
- I listened to someone's problems to try to improve how they felt
- I ignored someone to try to make them feel worse
- I spent time with someone to try to improve how they felt

Q4 There are occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make themselves feel worse (e.g., less cheerful, less excited, more angry, more worried). To what extent have you used the following strategies to influence the way you feel over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

Answers: (1- Not at all, 2- Just a little, 3- A moderate amount, 4, Quite a lot, or 5- A great deal)

- I looked for problems in my current situation to try to make myself feel worse
- I thought about my positive characteristics to try to make myself feel better
- I started an argument with someone to try to make myself feel worse

- I laughed to try to improve how I felt
- I expressed cynicism to try to make myself feel worse
- I thought about my shortcomings to try to make myself feel worse
- I did something I enjoy to try to improve how I felt
- I sought support from others to try to make myself feel better
- I thought about negative experiences to try to make myself feel worse
- I thought about something nice to try to make myself feel better
- I listened to sad music to try to make myself feel worse
- I thought of positive aspects of my situation to try to improve how I felt
- I avoided thinking about things to try to make myself feel better
- I hid my feelings to try to improve how I felt
- I wished I was someone else, to try to improve the way I felt
- I took my feelings out on others to try to improve how I felt
- I dwelt on thoughts and feelings to try to make myself feel better

Q5 To what extent have you felt the following over the last two weeks:

Answers (1- Not at all, 2, 3, 4- Moderately, 5, 6, or 7- A lot)

- Happy
- Gloomy
- Anxious
- Calm
- Energetic
- Sluggish
- Angry
- Guilty
- Emotionally drained

- Used up
- Burned out
- At the end of your tether

Q6 People think and do many different things when they feel sad or depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

Answers (1 – Almost never; 2- Sometimes; 3- Often; or 4- Always)

- Think about how alone you feel
- Think 'I won't be able to do my job if I don't snap out of this'
- Think about your feelings of fatigue or achiness
- Think about how hard it is to concentrate
- Think 'what am I doing to deserve this?'
- Think about how passive and unmotivated you feel
- Analyse recent events to try to understand why you are depressed
- Think about how you don't seem to feel anything anymore
- Think 'why can't I get going?'
- Think 'why do I always react this way?'
- Go away away by yourself and think about why you feel this way
- Write down what you are thinking about and analyse it
- Think about a recent situation, wishing it had gone better
- Think 'I wont be able to concentrate if I keep feeling this way'
- Think 'why do I have problems other people don't have?'
- Think 'Why can't I handle things better?'
- Think about how sad you feel
- Think about all your shortcomings, failings, faults, and mistakes
- Think about how you don't feel up to doing anything

- Analyse your personality to try to understand why you are depressed
- Go someplace alone to think about your feelings
- Think about how angry you are with yourself

Q7 Think about the way you usually are with the friend you are participating with in this study and select the answer that best describes you for each of the following statements.

Answers (1- Not at all true; 2- A little true; 3- Somewhat true; Mostly True; or 5- Really True)

When we talk about our problems...

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.
- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.
- When my friend has a problem, I always try really hard to keep my friend talking about it.

- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.
- We'll talk about every part of the problem over and over.
- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Q8 Now we would like you to think about the way you usually are with the friend you are participating with in this study and select the answer that best describes you for each of the following statements.

Answers (1- Not at all true; 2- A little true; 3- Somewhat true; Mostly True; or 5- Really True)

When we talk about our problems...

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.
- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.
- When my friend has a problem, I always try really hard to keep my friend talking about it.
- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.

- We'll talk about every part of the problem over and over.
- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Q9 Which of the following best describes how close your relationship is to your friend you are participating in this study with? Please enter the corresponding number in the text box below. (1-7 of increasingly overlapping circles)

Q10 How close do you feel to this friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q11 Describing the relationship with your friend you are participating in this study with

Answers (1 - Not at all / 2 – A little / 3 – Quite a bit / 4 – Very much)

- To what extent could you turn to your friend for advice about problems?
- How hard do you need to work to avoid conflict with your friend?
- To what extent could you count on your friend for help with a problem?
- How upset does your friend sometimes make you feel?
- To what extent can you count on your friend to give you honest feedback, even if you might not want to hear it?
- How much does your friend make you feel guilty?
- How much do you have to "give in" in this relationship?
- To what extent can you count on your friend to help you if a family member very close to you died?
- How much does your friend want you to change?
- How positive a role does your friend play in your life?
- How significant is this relationship in your life?
- How close will your relationship be with your friend in 10 years?
- How much would you miss your friend if the two of you could not see or talk with each other for a month?
- How critical of you is your friend?
- If you wanted to go out and do something this evening, how confident are you that your friend would be willing to do something with you?
- How responsible do you feel for your friend's well-being?
- How much do you depend on your friend?
- To what extent can you count on your friend to listen to you when you are very angry at someone else?
- How much would you like your friend to change?
- How angry does your friend make you feel?
- How much do you argue with your friend?
- To what extent can you really count on your friend to distract you from your worries when you feel under stress?
- How often does your friend make you feel angry?
- How often does your friend try to control or influence your life?
- How much more do you give than you get from this relationship?

Q12 Think about the friend you are participating in this study with. Indicate to what extent each of the statements is true of your friendship.

Answers - (1- Not at all true / 2 – A little true / 3 – Somewhat true / 4 – Pretty true / 5 – Really true)

- We always tell each other our problems
- We talk about the things that make us sad
- I talk to my friend when I'm mad about something that happened to me
- We tell each other secrets
- We tell each other private things

Q13 Below is a list of statements dealing with your general feelings about yourself. Please select the statement which most applies to you.

Answers: (1 – Strongly Agree / 2 – Agree / 3 – Disagree / 4 – Strongly Disagree)

- On the whole, I am satisfied with myself
- At times, I think I am no good at all
- I feel that I have a number of good qualities
- I am able to do things as well as most other people
- I feel I do not have much to be proud of
- I certainly feel useless at times
- I feel that I'm a person of worth, at least on an equal plane with others
- I wish I could have more respect for myself
- All in all, I am inclined to feel that I am a failure
- I take a positive attitude toward myself

Thank you for completing this questionnaire. When both you and your friend have finished this questionnaire the researchers will contact you via e-mail to book in for a time to come into the lab to complete the second phase of the study. If you have experienced any problems with this questionnaire or have any problems, please do not hesitate to contact the researchers (oxstudy@gmail.com).Please CLICK onto the NEXT PAGE to confirm you have read this message.

Pre-Conversation (T2)

We are now going to ask you a series of questions about how you are currently feeling.

Q1 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Please indicate to what extent you feel this way at this moment.

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid
- Depressed

Q2 How close do you feel to your friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q3 Which of the following best describes how close your relationship is to your friend you are participating in this study with? Please enter the corresponding number in the text box below. (1-7 of increasingly overlapping circles)

Thanks for completing this questionnaire. You may now go back into the main room and wait for your friend to join you. Please CLICK onto the NEXT PAGE to confirm you have read this message.

Post-Conversation (T3)

We are now going to ask you some questions about the way you are currently feeling.

Q1 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Please indicate to what extent you feel this way at this moment.

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive

- Jittery
- Active
- Afraid
- Depressed

Q2 How close do you feel to your friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q3 Which of the following best describes how close your relationship is to your friend you are participating in this study with? Please enter the corresponding number in the text box below.

(1-7 of increasingly overlapping circles)

We are now going to ask you a series of questions about the conversation you have just had with you friend. Please think carefully about your answers.

Q4 Please describe the problem that you have just discussed with your friend (this information may be used to remind you of the conversation at the two-week follow-up)

Q5 Is this primarily your problem or your friend's problem?

Answer: (My Problem / My friend's problem)

Q6 What was the main theme of the problem?

Answer: (Romantic Relationships / Friends / Work University Life / Accommodation / Family / Health / Finance / Job prospects / Uncertainty about the future / Other)

Q7 Did the experimenter ask you to talk about the problem in a particular way?

Answer: (Yes, they asked me and my friend to try to think of solutions to the problem / Yes, they asked me and my friend to think of all the negative things about the problem / No, they just asked me and my friend to talk about the problem as naturally as possible)

Q8 How similar would you say this conversation was to conversations you usually have with your friend?

(1-not similar at all/ 2 / 3 / 4 / 5 / 6 / 7 – similar)

Q9 How natural would you say this conversation felt compared to conversations you usually have with your friend?

(1-not natural at all/ 2 / 3 / 4 / 5 / 6 / 7 – very natural)

Q10 How important is the problem to you?

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q11 How important is the problem to your friend?

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q12 How worried are you about the problem?

(1-not worried at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely worried)

Q13 How worried do you think your friend is about the problem?

(1-not worried at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely worried)

Q14 How depressed are you about the problem?

(1-not depressed at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely depressed)

Q15 How depressed do you think your friend is about the problem?

(1-not depressed at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely depressed)

Q16 How much control do you feel you have over the problem?

(1-no control at all/ 2 / 3 / 4 / 5 / 6 / 7 – complete control)

Q17 How much control do you think your friend has over the problem?

(1-no control at all/ 2 / 3 / 4 / 5 / 6 / 7 – complete control)

Q18 How often have you previously spoken to your friend about this problem (before you came into the lab)?

(1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q19 How often have you previously spoken to your friend about this problem in the past two weeks (before you discussed the problem in lab today)?

(1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q20 Estimate, as accurately as possible, how many times you have spoken to your friend about this problem in the past two weeks.

(0-100)

Q21 Have you discussed this problem with anyone else? If yes, how many other people (Please answer in digits only)?

(Yes/No)

Q22 Before you came into the lab, how often had you thought about the problem by yourself in the past two weeks?

(1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q23 Estimate, as accurately as possible, how many times you have thought about this problem in the past two weeks. (0-100)

Q24 During the conversation you have just had with your friend, to what extent do you feel you and your friend discussed ways in which you could solve the problem?

(1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – very much so)

Q25 During the conversation you have just had with your friend, to what extent do you feel you and your friend focused on the negative aspects of the problem (i.e. negative causes, consequences and feelings)?

(1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – very much so)

Q26 Did you and your friend only discuss the problem you selected at the start of the conversation?

(1 - Yes, we only talked about the problem we selected and nothing else / 2 / 3 / 4 / 5 / 6 / 7 – No, we frequently went off topic and discussed other things)

Q27 Do you feel you could have carried on discussing the problem for longer?

(1 – not at all / 2 / 3 / 4 / 5 / 6 / 7 very much)

Q28 Please rate each of the following statements by indicating to what extent you and your friend engaged in these actions during the conversation you had in the lab:

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

- We tried to solve the problem
- We talked about negative aspects of the problem
- We talked about how bad the problem made me feel
- We talked about how bad the problem made my friend feel
- I tried really hard to encourage my friend to talk about the problem
- Your friend tried really hard to encourage you to talk about the problem
- We talked about parts of the problem we did not understand
- We went off topic and discussed something other than the problem
- I tried to get my friend to discuss every detail of what happened
- My friend tried to get me to discuss every detail of what happened
- We tried to figure out why the problem happened
- We discussed what bad things might happen because of the problem

Q29 How much do you feel you were driving the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q30 Who do you feel talked more during the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q31 How much do you feel you and your friend speculated about causes of the problem during the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q32 How much do you feel you and your friend speculated about consequences of the problem during the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q33 How much do you feel you and your friend speculated about parts of the problem that you do not understand during the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q34 How much do you feel you and your friend focused on negative feelings during the conversation?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Now we are going to ask you to complete a few questions about how you normally discuss problems with this friend. This is the last section.

Q35 In general, would you say you enjoyed discussing problems with your friend?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q36 In general, when you discuss problems with your friend do you tend to discuss the same problem over and over again?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – Yes, A lot)

Q37 How often have you seen or spoken to your friend (including on the phone) in general in the past two weeks?

(Answers 1-Not at all/ 2 / 3 / 4 / 5 / 6 / 7 – a great deal)

Q38 Estimate, as accurately as possible, how many times you have seen or spoken to your friend (including on the phone) in general in the past two weeks.

(0-100)

PLEASE REMEMBER that you will be e-mailed a follow-up questionnaire in two weeks time. This questionnaire is short and it is really important for this study that you complete this questionnaire as soon as it is e-mailed to you. Please remind your friend to do the same.

WE WILL NOT BE ABLE TO PAY YOU OR GIVE YOU COURSE CREDIT UNTIL YOU HAVE COMPLETED THE LAST QUESTIONNAIRE.

If you experienced any problems completing the current questionnaire, please discuss this with the experimenter now. You may now move back into the main room and wait for your friend to finish. Please CLICK onto the NEXT PAGE to confirm you have read this message.

Two-Week Follow-up (T4)

Please enter your unique participant number here. It is in the original email we send you.

You will now be asked to answer a series of questions about how you are feeling currently and about the problem that you discussed two weeks ago with your friend. If you cannot remember what the problem was then please contact the researcher and they will send you a reminder (oxstudy@gmail.com).

Q1 This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer. Please indicate to what extent you have been feeling that way today.

- Interested
- Distressed
- Excited

- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous
- Determined
- Attentive
- Jittery
- Active
- Afraid
- Depressed

Q2 How close do you feel to your friend?

(1-not close at all/ 2 / 3 / 4 / 5 / 6 / 7 – very close)

Q3 Which of the following best describes how close your relationship is to your friend you are participating in this study with? Please enter the corresponding number in the text box below.

(1-7 of increasingly overlapping circles)

Q4 This questionnaire consists of 21 groups of statements. Please read each group of statements carefully and then pick the one statement in each group that best describes the way you have been feeling in the past two weeks, including today.

(All answers have their own set of responses, they are scored from 1- 4)

Sadness

(I do not feel sad / I feel sad much of the time / I'm sad all the time / I'm so sad and unhappy that I can't stand it)

Pessimism

(I'm not discouraged about my future / I feel more discouraged about my future in the past two weeks / I do not expect things to work out for me / I feel my future is hopeless and will only get worse)

Past Failure

(I do not feel like a failure / I have failed more than I should have / As I look back, I see my life as a series of failures / I feel I am a total failure as a person)

Loss of Pleasure

I get as much pleasure as I ever did from the things I enjoy / I don't enjoy things as much as I used to / I get very little pleasure from the things I used to enjoy / I can't get any pleasure from the things I used to enjoy)

Guilty Feelings

(I don't feel particularly guilty / I feel guilty over many things I have done or should have done / I feel quite guilty most of the time / I feel guilty all of the time)

Punishment Feelings

(I don't feel I am being punished / I feel I may be punished / I expect to be punished / I feel I am being punished)

Self-Dislike

(I feel the same about myself as ever / I have lost confidence in myself in the past two weeks / I am dissapointed in myself / I dislike myself)

Self criticalness

(I don't criticise or blame myself more than usual / I am more critical of myself than I used to be / I criticise myself for all of my faults / I blame myself for everything bad that happens)

Suicidal thoughts or wishes

(I don't have any thoughts of killing myself / I have thoughts of killing myself, but I would not carry them out / I would like to kill myself / I would kill myself if I had the chance)

Crying

(I don't cry more than I used to / I cry more than I used to / I cry over every little thing / I feel like crying but I can't)

Self-criticalness

(I don't criticise or blame myself more than usual / I am more critical of myself than I used to be / I criticise myself for all of my faults / I blame myself for everything bad that happens)

Agitation

(I am no more restless or wound up than usual / I feel more restless or wound up than usual / I am so restless or agitated that it is hard to stay still / I am so restless or agitated that I have to keep moving or doing something)

Loss of Interest

(I have no lost interest in other people or activities / I am less interested in other people or things in the past two weeks / I have lost most of my interest in other people or things / It's hard gaining interest in anything)

Indecisiveness

(I make decisions about as well as ever / I find it more difficult to make decisions than usual / I have much greater difficulty making decisions than I used to / I have trouble making any decisions)

Worthlessness

(I do not feel I am worthless / I don't think that I'm as worthwhile as useful as I used to / I feel more worthless as compared to other people / I feel utterly worthless)

Loss of energy

(I have as much energy as ever / I have less energy in the past two weeks / I don't have enough energy to do very much / I don't have enough energy to do anything)

Changes in sleeping patterns

(I have not experienced any change in my sleeping pattern / I sleep somewhat more OR less than usual / I sleep a lot more OR less than usual / I sleep most of the day OR I wake up 1-2 hours early and can't get back to sleep)

Irritability

(I am no more irritable than usual / I am more irritable than usual / I am much more irritable than usual / I am irritable all the time)

Changes in appetite

(I have not experienced any change in my appetite / My appetite is somewhat less than usual OR My appetite is somewhat greater than usual / My appetite

is much less than usual OR My appetite is much greater than usual / I have no appetite at all OR I crave food all the time)

Concentration difficulty

(I can concentrate as well as ever / I can't concentrate as well as usual / It's hard to keep my mind on anything for long / I find I can't concentrate on anything)

Tiredness or fatigue

(I am no more tired or fatigued than usual / I am more tired or fatigued more easily than usual / I am too tired or fatigued to do a lot of things I used to do / I am too tired or fatigued to do most of the things I used to do)

Loss of interest in sex

(I have not noticed any recent change in my interest in sex / I am less interested in sex than I used to be / I am much less interested in sex now / I have lost interest in sex completely)

Q5 Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past two weeks, including today, by marking the appropriate answer.

Answer: (Not at all / Mildly, but it didn't bother me much / Moderately - it wasn't pleasant at times / Severely - it bothered me a lot)

- Numbness or tingling
- Feeling hot
- Wobbliness in legs
- Unable to relax
- Fear of worst happening
- Dizzy or lightheaded
- Heart pounding/racing
- Unsteady
- Terrified or afraid
- Nervous
- Feeling of choking
- Hands trembling
- Shaky / unsteady
- Fear of losing control
- Difficulty in breathing
- Fear of dying
- Scared
- Indigestion
- Faint / lightheaded
- Face flushed
- Hot / cold sweats

Thanks for completing the questions on how you are feeling. You will now be asked a series of questions about the problem you discussed with your friend when your came into the lab two weeks ago. Please read the questions carefully.

Q6 How important is the problem to you?

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q7 How important is the problem to your friend?

(1-not important at all/ 2 / 3 / 4 / 5 / 6 / 7 – very important)

Q8 How worried are you about the problem?

(1-not worried at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely worried)

Q9 How worried do you think your friend is about the problem?

(1-not worried at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely worried)

Q10 Has the amount you are worrying about the problem changed since you discussed it in the lab? (Yes/No)

Q11 How depressed are you about the problem?

(1-not depressed at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely depressed)

Q12 How depressed do you think your friend is about the problem?

(1-not depressed at all/ 2 / 3 / 4 / 5 / 6 / 7 – extremely depressed)

Q13 To what extent have you tried to solve the problem in the past two weeks?

(Not at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 - I have tried very hard to solve the problem)

Answer If 'To what extent have you tried to solve the problem in the...' 1 (Not at all) Is Not Selected

Q14 To what extent were you successful?

(Not successful at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – Very successful)

Q15 How much control do you feel you have over the problem?

(No control at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – Complete control)

Q16 How much control do you think your friend has over the problem?

(No control at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – Complete control)

Q17 Is the problem still ongoing? (Yes / No)

Q18 How often have you spoken to your friend about this problem in the past two weeks?

(Not at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – A great deal)

Q19 Estimate, as accurately as possible, how many times you have spoken to your friend about this problem in the past two weeks.

(0-100)

Q20 How often have you spoken to your friend in general in the past two weeks?

(Not at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – A great deal)

Q21 Estimate, as accurately as possible, how many times you have spoken to your friend in general in the past two weeks

(0-100)

Q22 Have you discussed this problem with anyone else in the past two weeks? If yes, how many other people (Please answer in digits only)?

(Yes 0-100 / No)

Q23 How often had you thought about the problem by yourself in the past two weeks?

(Not at all – 1 / 2 / 3 / 4 / 5 / 6 / 7 – A great deal)

Q24 Estimate, as accurately as possible, how many times you have thought about this problem in the past two weeks.

(0-100)

You are now over half way through the questionnaire...

Q25 Now we would like you to think about the way you usually are with the friend you are participating with in this study and select the answer that best describes you for each of the following statements.

Answers (1- Not at all true; 2- A little true; 3- Somewhat true; Mostly True; or 5- Really True)

When we talk about our problems...

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.
- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.
- When my friend has a problem, I always try really hard to keep my friend talking about it.
- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.
- We'll talk about every part of the problem over and over.

- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Q26 Think about the friend you are participating in this study with. Indicate to what extent each of the statements is true of your friendship.

(1- Not at all true / 2 – A little true / 3 – Somewhat true / 4 – Pretty true / 5 – Really true)

- We always tell each other our problems
- We talk about the things that make us sad
- I talk to my friend when I'm mad about something that happened to me
- We tell each other secrets
- We tell each other private things

You are nearly at the end of the questionnaire.

Q27 People think and do many different things when they feel sad or depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

Answers (1 – Almost never; 2- Sometimes; 3- Often; or 4- Always)

- Think about how alone you feel
- Think 'I won't be able to do my job if I don't snap out of this'

- Think about your feelings of fatigue or achiness
- Think about how hard it is to concentrate
- Think 'what am I doing to deserve this?'
- Think about how passive and unmotivated you feel
- Analyse recent events to try to understand why you are depressed
- Think about how you don't seem to feel anything anymore
- Think 'why can't I get going?'
- Think 'why do I always react this way?'
- Go away away by yourself and think about why you feel this way
- Write down what you are thinking about and analyse it
- Think about a recent situation, wishing it had gone better
- Think 'I wont be able to concentrate if I keep feeling this way'
- Think 'why do I have problems other people don't have?'
- Think 'Why can't I handle things better?'
- Think about how sad you feel
- Think about all your shortcomings, failings, faults, and mistakes
- Think about how you don't feel up to doing anything
- Analyse your personality to try to understand why you are depressed
- Go someplace alone to think about your feelings
- Think about how angry you are with yourself

Thank you for completing the questionnaire.

You will shortly receive your RPS credits or your payment.

Please contact the experimenter to arrange collection of payment if you did not express that you would like to receive Amazon vouchers via email. If you have changed your mind and you would prefer to be emailed Amazon vouchers then please email oxstudy@psy.ox.ac.uk.

You will shortly be e mailed a form detailing the full nature of the experiment. If you have any questions please do not hesitate to contact the experimenter (oxstudy@psy.ox.ac.uk).

Please CLICK onto the NEXT PAGE to confirm you have read this message and to register for your payment.

Appendix 6 – Study 4 Questionnaire

Questionnaire

Intro In order to learn a little bit more about the people who have completed our diary study, we would like to ask you to complete the following survey. In the survey you will be asked to provide a few demographic details before completing a number of questionnaires which will ask you questions about how you see yourself as a person on various aspects (e.g. expressivity, mood & emotions). All the questionnaires and rating scales have their own individual instructions. Read them carefully before completing a specific questionnaire. Please try and complete the whole survey in one go. We anticipate that this will take you no more than 20 minutes.

Please enter your participant number here. It is in the original email we sent you with the link to the diary.

Q1 What is your gender?

Male / Female

Q2 What is your age?

Q3 Education Highest education completed:

To age 16 or less / To age 18 only / Completed Higher education / Completed Postgraduate studies / Other. Please specify

Q4 Employment Please indicate your current employment situation (tick all that apply)

In full-time education / In part-time education / Employed 1-30 hours per week / Employed 31 + hours per week / Housewife/ House-husband / Retired / Other. Please specify

Q5 What is your country of origin?

Q6 Are you a native English speaker?

Yes / No

Answer: If Are you a native English speaker? No Is Selected

Q7 If you are not a native English speaker, how long have you lived in an English speaking country?

Two years or less / More than 2 years

Q8 What is your race/ ethnicity?

Q9 Here are a number of personality traits that may or may not apply to you. Please tick the number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

(Answers: 1 – disagree strongly / 2 / 3 / 4 / 5 / 6 / 7- agree strongly)

- Extraverted, enthusiastic
- Critical, quarrelsome.
- Dependable, self-disciplined.
- Anxious, easily upset.
- Open to new experiences, complex.
- Reserved, quiet.
- Sympathetic, warm.
- Disorganized, careless
- Calm, emotionally stable.
- Conventional, uncreative.

Q10 In general, how much are you bothered by each of the following problems on a DAY-TO-DAY basis?

(Answers: 1 - Rarely or never / 2 / 3 / 4- Almost always)

- Numbness or tingling
- Feeling hot
- Wobbliness in legs
- Unable to relax
- Fear of worst happening
- Dizzy or lightheaded
- Heart pounding/racing
- Unsteady
- Terrified or afraid

- Nervous
- Feeling of choking
- Hands trembling
- Shaky / unsteady
- Fear of losing control
- Difficulty in breathing
- Fear of dying
- Scared
- Indigestion
- Faint / lightheaded
- Face flushed
- Hot/cold sweats

Q11 How do you cope with events? Directions: Everyone gets confronted with negative or unpleasant events now and then and everyone responds to them in his or her own way. For the following questions, please indicate what you generally think when you experience negative or unpleasant events.

(Answers: 1 – Almost never / 2 / 3 / 4 / 5 – Almost Always)

- I think that I have to accept that this has happened
- I often think about how I feel about what I have experienced
- I think I can learn
- I feel that I am the one who is responsible for what has happened something from the situation
- I think that I have to accept the situation
- I am preoccupied with what I think and feel about what I have experienced
- I think of pleasant things that have nothing to do with it
- I think that I can become a stronger person as a result of what has happened
- I keep thinking about how terrible it is what I have experienced
- I feel that others are responsible for what has happened
- I think of something nice instead of what has happened
- I think about how to change the situation
- I think that it hasn't been too bad compared to other things
- I think that basically the cause must lie within myself
- I think about a plan of what I can do best
- I tell myself that there are worse things in life
- I continually think how horrible the situation has been
- I feel that basically the cause lies with others

Q12 For each statement below, please indicate your agreement or disagreement. Please do so by ticking one of the boxes beside each statement.

(Answers: 1 – Strongly Disagree / 2 / 3 / 4 / 5 – Strongly Agree)

- Whenever I feel positive emotions, people can easily see what I am feeling
- I sometimes cry during sad movies.
- People often do not know what I am feeling.
- I laugh out loud when someone tells me a joke that I think is funny.
- It is difficult for me to hide my fear.
- When I am happy, my feelings show.
- My body reacts very strongly to emotional situations.
- I've learned it is better to suppress my anger than to show it.
- No matter how nervous or upset I am, I tend to keep a calm exterior.
- I am an emotionally expressive person.
- I have strong emotions.
- I am sometimes unable to hide my feelings, even though I would like to.
- Whenever I feel negative emotions, people can easily see exactly what I am feeling.
- There have been times when I have not been able to stop crying even though I tried to stop.
- I experience my emotions very strongly.
- What I am feeling is written all over my face.

Q13 This scale consists of a number of words that describe different feelings and emotions. Please rate to what extent you have felt this way during the past month:

(Answers: 1 – very slightly or not at all / 2 / 3 / 4 / 5 – Extremely)

- Interested
- Distressed
- Excited
- Upset
- Strong
- Guilty
- Scared
- Hostile
- Enthusiastic
- Proud
- Irritable
- Alert
- Ashamed
- Inspired
- Nervous

- Determined
- Attentive
- Jittery
- Active
- Afraid

Q14 What you might do when you are feeling a bit down People think and do many different things when they feel sad or depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

(Answers: 1 – Almost never / 2 / 3 / 4 / - Always)

- Think about how alone you feel
- Think 'I won't be able to do my job if I don't snap out of this'
- Think about your feelings of fatigue or achiness
- Think about how hard it is to concentrate
- Think 'what am I doing to deserve this?'
- Think about how passive and unmotivated you feel
- Analyse recent events to try to understand why you are depressed
- Think about how you don't seem to feel anything anymore
- Think 'why can't I get going?'
- Think 'why do I always react this way?'
- Go away by yourself and think about why you feel this way
- Write down what you are thinking about and analyse it
- Think about a recent situation, wishing it had gone better
- Think 'I won’t be able to concentrate if I keep feeling this way'
- Think 'why do I have problems other people don't have?'
- Think 'Why can't I handle things better?'
- Think about how sad you feel

- Think about all your shortcomings, failings, faults, and mistakes
- Think about how you don't feel up to doing anything
- Analyse your personality to try to understand why you are depressed
- Go someplace alone to think about your feelings
- Think about how angry you are with yourself

Q15 Talking with your friend about issues that concern you The following questions relate to how you and a close friend talk about issues that concern you, your friend or both of you. Think about the way you usually are with your friend and select the option that best describes you for each of the following statements .

Answers (1- Not at all true; 2- A little true; 3- Somewhat true; Mostly True; or 5- Really True)

<u>When we talk about our problems...</u>

- We spend most of our time together talking about problems that my friend or I have.
- If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
- After my friend tells me about a problem, I always try to get my friend to talk some more about it later on.
- When I have a problem, my friend always tries really hard to keep me talking about it.
- When one of us has a problem, we talk to each other about it for a long time.
- Whenever we see each other, if one of us has a problem, we will talk about that problem even if we had planned to do something else together.
- When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
- After I've told my friend about a problem, my friend always tries to get me to talk some more about it later.
- We talk about problems that my friend or I are having almost every time we see each other.
- If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.

- When my friend has a problem, I always try really hard to keep my friend talking about it.
- When I have a problem, my friend always tries to get me to tell every detail about what happened.

When we talk about a problem that one of us has....

- We will keep talking even after we both know all of the details about what happened.
- We talk for a long time trying to figure out all of the different reasons why the problem might have happened.
- We try to figure out every one of the bad things that might happen because of the problem.
- We spend a lot of time trying to figure out parts of the problem that we cannot understand.
- We talk a lot about how bad the person with the problem feels.
- We'll talk about every part of the problem over and over.
- We talk a lot about the problem in order to understand why it happened.
- We talk a lot about all of the different bad things that might happen because of the problem.
- We talk a lot about parts of the problem that don't make sense to us.
- We talk for a long time about how upset is has made one of us with the problem.
- We usually talk about that problem every day even if nothing new has happened.
- We talk about all of the reasons why the problem might have happened.
- We spend a lot of time talking about what bad things are going to happen because of the problem.
- We try to figure out everything about the problem, even if there are parts that we may never understand.
- We spend a long time talking about how sad or mad the person with the problem feels.

Thank you very much for your participation in this research. You will be send a debriefing letter in the next week or so. In the mean time, if you have any questions or concerns, please contact the researchers by emailing Laura Taylor

Daily Diary

Dear participants, Welcome once more to your diary. Below a few reminders and additional information, please read!:

*Please complete this diary at the end of the day in as much detail as possible.

*Please complete the mood scales every evening, even if you have nothing further to report (i.e. no problem discussion).

*Please restrict yourself to reporting on the 3 most significant problems you have discussed throughout the day.

*Please always report on the most important problem you have discussed during a particular day first followed by the next most important and then followed by the third most important.

*Please remember that the problems do not have to be extremely important or life changing, just something you felt inclined to discuss with someone else. This can be a discussion about anything from friendship/relationship problems, problems at college to problems dealing with uni work.

*If there are issues you would rather not think about at all, please do not feel obliged to report on them in the questionnaires.

*Getting in touch: Any problems with the diary completion or the study in general, please contact the researchers through Gwenda Simons or Laura Taylor (gwenda.simons@psy.ox.ac.uk or laura.taylor@psy.ox.ac.uk).

*Please note that you can withdraw from the study at any stage by dropping us an email with your participant number.

- Please enter your participant number below. This is in the email we send to you with the link to the diary.

First of all, please indicate how you are currently feeling on the following scales

Q1 MOOD On a scale from 1 to 10 (not at all - extremely), please indicate the extent to which you are currently experiencing each of the following:

- HAPPY
- SAD
- ANXIOUS/ WORRIED
- RELAXED
- ANGRY
- EXCITED
- CONTENT
- CONFUSED
- POSITIVE/ OPTIMISTIC
- NEGATIVE/ PESSIMISTIC

Thank you for completing the mood ratings.

Q2 Have you discussed a problem with another person today? This should be (one of) your problem(s).

Yes / No – If no then survey complete)

Problem Discussion 1 (Please remember this should be the most important problem you have discussed today)

Q3 When did you have the discussion?(please choose from the dropdown list)

- between 1am and 7am
- between 7am and 9am
- between 9am and 11am
- between 11am and 1pm
- between 1pm and 3pm
- between 3pm and 5pm
- between 5pm and 7pm
- between 7pm and 9pm
- between 9pm and 11pm
- between 11pm and 1am

Q4 Please describe the topic discussed in detail

Q5 How long did the conversation last (in minutes)?

Q6 How important is the problem to you? (on a scale from 1-5: not important at all to very important)

1 - Not important at all / 2 / 3 / 4 / 5 – very important

Q7 How useful did you find this discussion? (on a scale from 1-5: not useful at all to very useful)

1 - Not useful at all / 2 / 3 / 4 / 5 – very useful

Q8 Who did you discuss this problem with?

A friend from college

A friend from your department

A friend from Oxford, not in your college or department

Another friend

A family member, please describe relation (mother, father etc)
_____

Partner

A college tutor

A member of university staff

Other, please describe _____

Q9 Was the person you discussed the problem with male or female?

Male / Female

Q10 How old is this person (in years)?

Q11 How long have you known this person (in years and/ or months)?

Q12 How similar do you feel to this person?

1 – Not similar at all / 2 / 3 / 4 / 5 / 6 / 7- very similar

Q13 Which of the following best describes how close your relationship is to this person (a value from 1-7)? Please enter the corresponding number in the text box below.

Q14 Have you discussed this specific problem with this person before?

Yes / No - if no is selected then skip to 'have you discussed this problem with anyone else?'

Q15 Please indicate how often you discussed this specific problem with this person

Today / During the past week / During the past month

Q16 Have you discussed any other of your problems with this person today?

Yes / No - If no is selected, then skip to 'how often do you discuss problems in ...'

Q17 How many other problems have you discussed with this person today? (please choose from the dropdown list)

1 / 2 / 3 / 4 / 5 or more

Q18 How often do you discuss problems in general with this person? (please choose from the dropdown list)

Never / Less than Once a Month / Once a Month / 2-3 Times a Month / Once a Week / 2-3 Times a Week / Daily

Q19 How often do you have conversations in general with this person? (please choose from the dropdown list)

Never / Less than Once a Month / Once a Month / 2-3 Times a Month / Once a Week / 2-3 Times a Week / Daily

Q20 Have you discussed this problem with anyone else?

Yes / No - If no is selected, then skip to how much have you thought about this ...

Q21 How many other people have you discussed this problem with? (please choose from the dropdown list)

1 / 2 / 3 / 4 / 5 or more

Q22 Who is this person (people)? Please describe

Q23 How much have you thought about this problem while you were alone today?

Never / 2 / 3 / 4 5 – Quite a lot

Q24 For each of the scales below we would like you to rate how you feel about this problem.

On a scale from 1 to 10 (not at all - extremely), please indicate on each of the following scales how you felt when discussing the problem:

- HAPPY
- SAD
- ANXIOUS/ WORRIED
- RELAXED
- ANGRY
- EXCITED
- CONTENT
- CONFUSED
- POSITIVE/ OPTIMISTIC
- NEGATIVE/ PESSIMISTIC

Thanks for completing the questions about your first problem discussion

Q25 Have you discussed another problem with anyone today, the same problem with a different person, or a different problem with the same person (remember it has to be your problem)?

Yes / No – Questionnaire complete

[If the participant selected yes then they were given questions Q3-24 again, this was then repeated a third time if the participant had a third problem to report]

Appendix 7 – Diary 16-18

Day __

Please complete this questionnaire in the evening.

This scale consists of a number of words that describe different feelings and emotions. Please read EACH item and indicate **to what extent you have been feeling that way TODAY.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested					
Distressed					
Excited					
Upset					
Strong					
Guilty					
Scared					
Hostile					
Enthusiastic					
Proud					
Irritable					
Alert					
Ashamed					
Inspired					
Nervous					
Determined					
Attentive					
Jittery					
Active					
Afraid					

Please check that you have completed all items

Have you discussed a **problem** with anyone today? (Please circle) Yes

No

If you answered 'No', please go back and check you have completed all the questions above and make sure that you complete the whole questionnaire again tomorrow night.

If you answered 'Yes' then please answer the following questions

---

If yes, how many problems have you discussed TODAY? (please write a number) ☐

With how many people have you discussed your problem(s) TODAY? (please write a number) ☐

If you discussed more than one problem today, I would like you to think of the problem that was most important to you.

Please tick a box to indicate what the problem was about? (You may tick more than one)

Friends	
Work	
School	
Romantic Relationships	
Family	
Home	
Summer School	
Future plans	
Health	
Money	
Going to University	
Other	

Who have you discussed the problem with? (You may tick more than one)

Another summer school student	
A summer school counsellor	
A family member	
A friend from home	
Someone else	

How important is the problem to you? (Please circle)

1 Not important at all	2	3	4 Moderately Important	5	6	7 Very Important

Did discussing the problem(s), in general, make you feel better? (Please circle)

1 No it made me feel worse	2	3	4 It did not change my mood at all	5	6	7 It made me feel much better

It is very important that you have answered all the questions. Please go back and check that you have answered relevant questions.

Appendix 8 – Diary 11-16

DAY _____

1. This scale consists of a number of words that describe different feelings and emotions. Please read EACH item and tick the box to say **how much you have been feeling that way TODAY.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Interested					
Distressed					
Excited					
Upset					
Strong					
Guilty					
Scared					
Hostile					
Enthusiastic					
Proud					
Irritable					
Alert					
Ashamed					
Inspired					
Nervous					
Determined					
Attentive					
Jittery					
Active					
Afraid					

2. Have you discussed one of **YOUR problems** with anyone today? The problem must be YOUR problem and not the other person's problem. If it is a problem that both of you have then you should tick 'yes' (Please circle yes OR no)

YES	**NO**

If you answered 'No' to the question above, please go back and check you have completed all the questions above (You should have 20 ticks) and hand this form in to Miss Taylor.

If you answered 'Yes' then please answer the questions below.

---

3. How many of YOUR problems have you discussed TODAY? (Please write a number) ☐

Sometimes when we talk about our problems we don't want our friends to help us solve the problem, sometimes we just want to tell our friends about the problem, tell them how it is making us feel and talk about things that might happen because of the problem.

4. How much do you think you have been discussing problems in this way today (compared with other normal days)? (Pease circle)

1 Not at all	2	3	4	5	6	7 I have been doing this a lot

If you discussed more than one problem today, I would like you to think of the one problem that was most important to you. Now I would like you to answer the following questions thinking about the most important problem you have discussed today

---

5. Please tick the main thing the problem was about (ONLY TICK ONE)

Friends	
School Work	
Romantic Relationships	
Family / Home	
Future plans (things you are going to do)	
Health	
Money	

6. How many people have you discussed this problem with today? (Please write a number)

7. Who was the main person you discussed the problem with?

A school friend	
A friend outside school	
A family member (mum, dad, brother, sister, guardian)	
Teacher / House mistress	

8. When you talked about the problem (with the main person) which one of these things happened (you can tick more than one)

We talked about the problem over and over	
The other person tried really hard to get me to talk about the problem	
I tried really hard to get the other person to talk about the problem	
We talked about parts of the problem we did not understand	
We talked about how the problem made us feel	
We decided not to do what we were planning to (for example, not doing your work) so we could talk about the problem	
We talked about the things which might have caused the problem (made it happen)	
We talked about all the things that might happen after the problem (what other problems or things might happen because of this problem)	
We have talked about this problem lots before	

9. Think very hard, did you and your friend at any point try to solve the problem (make it go away) or were you just talking about it? It's OK if you did not try to solve it (Please circle yes or no)

YES	**NO**
we tried to solve the problem	we were just talking about the problem

10. Is today the first day you have spoken to someone else about this problem? (Please circle yes or no)

YES	**NO**
	I have spoken to someone about this problem before

11. How important is the problem to you? (Please circle)

1 Not important at all	2	3	4	5	6	7 Very Important

12. How did discussing the problem make you feel? (Please circle one number)

Very Negative (bad) Very Positive (good)

1	2	3	4	5	6	7

It is very important that you have answered all the questions. Please go back and check that you have answered all the questions. As always, if you are having any problems with this questionnaire, or the study in general, please speak to Miss Taylor, your Housemistress, or your Head of Year.

Appendix 9 – Time-points for Studies 2 and 3

Measures employed at 5 time-points in Study 2

Time 1 (1 week before the experimental interaction)	**Time 2** (Immediately before the experimental interaction)	**Time 3** (Immediately after the experimental interaction)	**Time 4** (Two weeks after the experimental interaction)	**Time 5** (6 months after the experimental interaction)
Demographic Friendship Co-rumination Questionnaire Ruminative Response Scale Positive and Negative Affect Scale Closeness	Positive and Negative Affect Scale Closeness	Positive and Negative Affect Scale Closeness Problem Selection Realism Thinking and Discussing the Problem	Positive and Negative Affect Scale Closeness Thinking and Discussing the Problem	Positive and Negative Affect Scale Closeness Thinking and Discussing the Problem Problem Resolution

See 3.3.3 (Study 2 Method) for further details of each of the measures

Measures employed at 4 time-points in Study 3

Time 1 (24 hours before the experimental interaction)	**Time 2** (Immediately before the experimental interaction)	**Time 3** (Immediately after the experimental interaction)	**Time 4** (Two weeks after the experimental interaction)
Demographic Beck Depression Inventory Beck Anxiety Inventory Co-rumination Questionnaire Ruminative Response Scale Positive and Negative Affect Scale Closeness Quality of Relationship Inventory Inclusion of the Other in the Self Scale Intimate Exchange Scale	Positive and Negative Affect Scale Closeness Inclusion of the Other in the Self Scale	Positive and Negative Affect Scale Closeness Importance Realism Thinking and Discussing the Problem Inclusion of the Other in the Self Scale Manipulation Checks	Beck Depression Inventory Beck Anxiety Inventory Co-rumination Questionnaire Ruminative Response Scale Positive and Negative Affect Scale Closeness Thinking and Discussing the Problem Inclusion of the Other in the Self Scale Intimate Exchange Scale

See 4.3.2 (Study 3 Method) for further details of each of the measures