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# How Individual Differences in Self- and Other-focused Co-rumination Relate to Internalizing Symptoms and Friendship Quality

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How Individual Differences in Self- and Other-focused Co-rumination  
Relate to Internalizing Symptoms and Friendship Quality

by

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A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
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## **Dedication**

For Weezy and the Bean, You motivate me to be better. I hope this inspires you to dream boundlessly, explore passionately, and live vulnerably. Work hard at something that matters to you and you can achieve almost anything. Enjoy the journey to your individual callings – you will get there and it is never too late. You have arrived when you feel tickled you get to do it (on most days). Be good friends, especially and always to each other. Forever, Mom

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## **Abstract**

Co-rumination involves friends spending a great deal of time encouraging each other to excessively discuss problems, with content being largely negative (Rose, 2002). Co-rumination appears to strengthen the bonds between best friends, while ironically exacerbating internalizing symptoms. Co-rumination is conceptualized as a mutual dyadic process, but little is known about the reciprocity of excessive problem discussion. The balance of college students' ( $N = 601$ ) self- and other-focused co-rumination with their best friend was assessed via an online survey. Contrary to expectations, inconsistent and weak evidence was obtained for differentiating self- and other-focused co-rumination, and their balance. Specifically, self- and other-focused co-rumination were highly correlated, similarly correlated with other study variables, and not differentiated in exploratory factor analysis. However, the interaction of self- and other-focused co-rumination in a model including individual characteristics and adjustment yielded differentiated results. Friendship intimacy was associated with self-, but not other-, focused co-rumination. Indicating that balance may matter, anxiety was associated with high self-focused co-rumination in the context of low other-focused co-rumination. Additionally, mean levels of all individual traits (rumination, excessive reassurance seeking, social perspective taking, perfectionism, negative problem orientation) and adjustment variables (anxiety, depression, social anxiety, friendship quality) differed as a function of co-rumination balance, as assessed by a one-item direct measure. The validity and utility of distinguishing self- and other-focused co-rumination is contingent on further exploration with dyadic data and perhaps modified

assessment. Rumination and excessive reassurance seeking indicated vulnerability for co-rumination, which appears to be a primarily anxious process.

## Introduction

Internalizing disorders are a major mental health concern with the identification of risk factors being a priority (e.g., Kessler & Wang, 2009). Rumination, or perseveration on distressed feelings, is the characteristic cognitive feature of internalizing symptoms (for reviews see Mor & Windquist, 2002; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). While rumination is conceptualized as an *individual* cognitive process, this type of consuming internal dialogue is sometimes, if not often, verbalized. The fact that rumination is voiced is important; it means there is opportunity for feedback, outside influence, and potentially a change in perspective. Co-rumination, or excessive problem discussion (Rose, 2002), is a *dyadic* process that mirrors characteristics of ruminative thought. Co-rumination is supported as an interpersonal etiological or maintenance factor related to the perpetuation of internalizing symptoms (for reviews see Bukowski, Adams, & Santo, 2006; Rose & Rudolph, 2006).

The purpose of the current study was to examine co-rumination in adult friendships, differentiate whose problems were the focus of problem discussion, and to explore individual characteristics potentially associated with co-rumination. Specifically, over-processing one's own problems with a friend (self-focused co-rumination) and engaging in excessive discussion of a friend's difficulties (other-focused co-rumination) were related to friendship quality and internalizing symptoms. The perceived symmetry of co-rumination, or the balanced discussion of each member's problems, was also considered. Interpersonal and clinical characteristics were

identified that were thought to predict squandering social time in excessive problem discussion and examined in a mediational pathway through co-rumination to adjustment (see Figure1).

### **Social Coping in the Context of Internalizing Symptoms**

Approximately one in five American adults will be diagnosed with a mood (20.8%) or anxiety disorder (28.8%) in their lifetime (Kessler et al., 2005; see also Kessler, Chiu, Demler, & Walters, 2005). Internalizing symptoms cause substantial impairment (e.g., Ferdinand, van der Reijden, Verhukst, Nienhuis, & Giel, 1995) and can contribute to other psychopathology (e.g., substance use, academic problems; Saraceno, Munafò, Heron, Craddock, & van den Bree, 2009; Strauss, Frame, & Forehand, 1988). There is strong continuity in internalizing symptoms, especially if left untreated (e.g., Pine, Cohen, Gurley, Brook, & Ma, 1998; for reviews see Monroe & Harkness, 2005, 2011). Unfortunately, only half (50.9%) of adults with diagnosable mood problems receive treatment, and even fewer (36.9%) when considering anxiety disorders (Wang et al., 2005). Without appropriate treatment, many distressed individuals turn to their friends to help them cope with problems. Even individuals who have overcome a depressive episode continue to exhibit more emotional reliance on others compared to non-distressed peers (Rohde, Lewinsohn, & Seeley, 1994), and will likely continue to seek social support from friends. Unfortunately, this may not always be helpful.

While often a successful coping strategy for many people, seeking social support may not be inherently adaptive (for a review see Skinner, Edge, Altman & Sherwood, 2003). It has also been associated with increased emotional distress (e.g., Bolger & Amarel, 2007; Carver & Scheier, 1994; for review Buunk & Hoorens, 1992), suggesting social support seeking can be harmful for some individuals or under certain circumstances. Friends tend to be similar and, therefore, anxious and depressed individuals often seek social support from equally negativistic

friends (e.g., Schwartz-Mette & Rose, 2012). Contact with another depressed person, even a stranger, confers risk for depressed mood (e.g., contagion among roommates: Joiner, Alfano, & Metalsky, 1992; spouses: Ruscher & Gotlib, 1988; strangers: Strack & Coyne, 1983). Having a depressed friend can certainly accentuate negative affect (Rook, Peitromonaco & Lewis, 1994; Stevens & Prinstein, 2005). If one is fortunate enough to have a positive friend, anxious and depressive manners of support seeking may be off-putting and ultimately lead to rejection or friendship dissolution (interpersonal stress generation; Hammen, 2006).

Depression and anxiety have been studied extensively, and much is known about the experience of internalizing symptoms. First, consistent gender differences emerge in adolescence, and continue throughout the lifespan (for reviews see Burstein et al., 2012; Lippa et al., 2012; Piggott, 2003; Twenge & Nolen-Hoeksema, 2002), with women reporting greater generalized anxiety, social anxiety, and depression compared to men. Second, comorbidity among internalizing disorders is high (Kessler, Chiu et al., 2005), and transdiagnostic constructs can often parsimoniously explain both anxiety and depression. Third, a key phenomenological feature of internalizing symptoms is the tendency to ruminate (for reviews see Mor & Windquist, 2002; Nolen-Hoeksema et al., 2008). Lastly, there often is social impairment associated with depression and anxiety (see Howell & Watson, 2008). While individuals with internalizing symptoms can exhibit social withdrawal, they typically still have friends and engage in some socializing (e.g., Brendgen, Vitaro, Turgeon, & Poulin, 2002; Demir & Urberg, 2004).

### **Co-rumination: Definition, Theory and Previous Literature**

Co-rumination is conceptualized as a manner of social coping that mirrors depressive rumination. Co-rumination is defined more specifically as excessive discussion, or rehashing, of personal problems, with content being largely negative (Rose, 2002; for reviews see Bukowski et

al., 2006; Rose & Rudolph, 2006). Co-rumination includes mutual encouragement by both dyad members to discuss problems frequently, repeatedly, and in lieu of other activities. In addition to its focus on negative feelings, problem discussion includes speculation about causes, negative consequences, and less understood parts of the problem.

Co-rumination was first studied as a bridge between friendship and coping literatures that might help explain gender differences in depression and anxiety. Since friendships are considered protective (e.g., Kendler, Myers, & Prescott, 2005), and females tend to have closer friendships than males, it appears on its face counterintuitive that females experience higher rates of internalizing symptoms. Rose (2002) speculated that a characteristic aspect of female friendships may actually contribute to the development of anxiety and depression. As a friend's commentary can influence social perception and adjustment (e.g., Dishion, Eddy, Haas, & Li, 1997; Smith-Schrandt, Ojanen, Gesten, Feldman, & Calhoun, 2011), friends' problem discussion might serve as a conduit for the socialization of internalizing symptoms. Co-rumination lies at the intersection of self-disclosure and rumination, sharing characteristics of both but itself a distinct construct. Co-rumination, like normative self-disclosure, involves sharing intimate thoughts and feelings, but co-rumination is more extreme and, like rumination, highlights negative affect (Rose, 2002). Because self-disclosure is related to relationship closeness and dwelling on negative conversation topics is associated with internalizing distress (Rose 2002), co-rumination is neither completely adaptive nor maladaptive.

Instead, co-rumination seems to offer "adjustment trade-offs" in that it is associated with both greater internalizing symptoms and perceptions of better friendship quality (e.g., Rose, 2002; Rose, Carlson, & Waller, 2007). Co-rumination might be reinforced through relationship enhancement (Waller & Rose, 2010). Said differently, one engages in co-rumination because it

makes one feel close to their friend, even though doing so worsens one's mood and likely, doesn't solve one's problems. Increased relationship satisfaction reinforces a behavioral vulnerability for internalizing symptoms. Co-rumination has been identified as an innovative, interesting, and potentially important social process contributing to psychopathology (Bukowski et al., 2006). Despite opening up a promising direction for the field, relatively few studies have considered the construct. A summary of the existing literature follows.

**Friendship Quality.** Co-rumination is routinely positively related to perceived friendship quality (e.g., Calmes & Roberts, 2008; Rose, 2002) and has been prospectively linked to increased friendship quality after six months (Rose et al., 2007). Moreover, co-rumination has also been positively correlated with self-perceived social competence (Starr & Davila, 2009). However, some evidence associates co-rumination with social deficits, such as having fewer friends and lower overall [teacher-reported] social adjustment (Tompkins, Hockett, Abraibesh, & Witt, 2011). Importantly, one prospective longitudinal study found that co-rumination predicted decreased friendship quality of adolescent females after one year (Starr & Davila, 2009). Aligned with findings that friendships of depressed individuals are unstable over time (e.g., Prinstein, Boreeli, Cheah, Simon, & Aikins, 2005), friendships may be initially enhanced, but damaged or dissolved in the long term by excessive problem discussion (Starr & Davila, 2009). Although associations with global social functioning and friendship longevity are unclear, it does appear that co-rumination increases felt intimacy and concurrent perceptions of friendship quality. Unfortunately, increases in relationship satisfaction serve to reinforce co-ruminating behavior, thereby increasing psychopathology.

**Anxiety and Depression.** Although friends may be well intentioned in their desire to provide social support, they may sometimes “play an ironic role” in the development of



emotional difficulties (Rose et al., 2007, p. 1029). Co-rumination plays a role in the contagion or spreading of both depression and anxiety during adolescence (Schwartz-Mette & Rose, 2012). Co-rumination has been repeatedly associated with anxiety and depression in children, adolescents, and adults (e.g., Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007; Tompkins et al., 2011). Longitudinal evidence suggests a bi-directional cycle with co-rumination effects accumulating over time (e.g., Hankin, Stone, & Wright, 2010; Rose et al. 2007; Schwartz-Mette & Rose, 2012). Co-rumination is associated with past depressive diagnoses while controlling for current symptoms (Stone et al., 2010) and also predicts onset, duration, and severity of clinical depression (Stone, Hankin, Gibb, & Abela, 2011).

Co-rumination is more than a correlate however of internalizing symptoms. Prospective longitudinal associations, ranging several months (Hankin et al., 2010; Rose et al., 2007; Schwartz-Mette & Rose, 2012) to two years (Stone et al., 2011), have been found between co-rumination and depression and anxiety. Hankin and colleagues (2010) support a bidirectional relationship with evidence that initial internalizing symptoms predicted later elevations in co-rumination, and in turn, co-rumination predicted later symptoms. Also supporting but not proving causation, analogue studies have experimentally elicited problem discussion and observed co-rumination amplified immediate stress response, namely dual activation of the hypothalamic-pituitary-adrenal axis (cortisol) and sympathetic nervous system (sAA) (Byrd-Craven, Geary, Rose, & Ponzi, 2008; Bryd-Craven, Granger, & Auer 2011). However, others have not found longitudinal increases in depressive symptoms (e.g., Starr & Davila, 2009) but speculate that co-rumination may contribute to small changes over time because their effect sizes, while not statistically significant, were similar in magnitude to those in previous studies with larger sample sizes (i.e., Rose et al., 2007).

Perhaps the strongest evidence for the unique predictive role of co-rumination in the development of internalizing symptoms comes from a recent two year prospective longitudinal study of co-rumination and clinically significant depressive episodes (Stone et al., 2011). Co-rumination not only predicted the onset of depressive episodes (both initial and recurrent episodes), but also episode severity and duration. Importantly, these findings remained when baseline depressive symptoms and rumination were co-varied statistically. In fact, co-rumination was a stronger predictor of depression than rumination in this study. Although not including anxiety, this is the most definitive evidence of the impact of co-rumination on affective wellbeing, and suggests that co-rumination is not simply verbalized rumination. Instead, co-rumination is an interpersonal process with additive and unique contributions to internalizing symptoms.

**Social Anxiety.** Social anxiety is often comorbid with other anxiety and mood disorders (for reviews see Horn & Wuyek, 2010; Ruscio, Brown, Chiu, Sareen, Stein, & Kessler, 2008), but with a distinctive interpersonal profile. For example, socially anxious individuals are less likely to self-disclose than control participants (Alden & Bieling, 1998; Meleshko & Alden, 1993) and tend to be overly reliant on the few relationships they do form (Darcy, Davila, & Beck, 2005). Socially anxious people may not feel comfortable opening up about personal problems even with their closest friends. In fact, they may be particularly concerned about burdening friends with their problems for fear of judgment about their functioning. Due to the non-normative nature of self-disclosure in male friendships, socially anxious men may be especially unlikely to discuss their problems in detail.

Interestingly, in the first study to differentiate among anxiety symptoms, social anxiety was associated with *less* co-rumination, in contrast with co-rumination's relationship to other

internalizing symptoms (Starr & Davila, 2009). Because the relationship between depression and co-rumination was strengthened when social anxiety was statistically controlled (Starr & Davila, 2009), comorbid social anxiety might distort, or weaken, empirical relationships between co-rumination and other internalizing symptoms (also see Starr & Davila, 2008a). If replicated, these findings would strongly support the inclusion and statistical control of social anxiety in co-rumination studies. In contrast, social anxiety has indirectly predicted *increased* co-rumination over time via rumination (Jose, Wilkens, & Spendelov, 2012). These contrary findings warrant further examination.

**Mechanisms of Influence.** With co-rumination recently established as a meaningful construct, two mechanisms have been empirically examined to explain how or why co-rumination relates to emotional distress, namely empathetic distress (Smith & Rose, 2011) and stress generation (Hankin et al., 2010). Believing that the ability to step into another person's shoes, or social perspective taking ability, may be a key ingredient, or necessary precursor, of co-rumination, Smith and Rose (2011) introduced the idea of empathetic distress, defined as the tendency to adopt or take on another person's anguish as your own. Supporting the notion of "cost of caring", social perspective taking directly related to co-rumination tendencies, and co-rumination predicted empathetic distress. Further, co-rumination mediated the relationship between social perspective taking ability and empathetic distress. Thus, one way that co-rumination contributes to internalizing symptoms may be through the accumulation of emotional distress related to discussing other people's problems.

Females has been found to experience more controllable (dependent) stress, which is partially related to their tendency to co-ruminate (Bouchard & Shih, 2013). Further, co-rumination about controllable (dependent) and social, but not uncontrollable (independent) or

nonsocial, stress has been related to depressive symptoms (Nicolai, Laney, & Mezulis, 2013) found co-rumination. Hankin and colleagues (2010) found that the relationship between co-rumination and later internalizing symptoms is mediated by interpersonal dependent stressors, defined as personal problems at least partially attributable to the person (e.g., fight with friend, breakup with boyfriend) versus independent or uncontrollable events (e.g., close friend moves). Drawing upon interpersonal theories of depression and the process of stress generation (for a review see Hammen, 2006), Hankin and colleagues (2010) concluded that co-rumination may contribute to problems within the friendship and eventually lead to rejection or friendship dissolution (Hankin et al., 2010). Co-rumination may not result in lasting friendship quality (e.g., Starr & Davila, 2009), and may not be associated with enjoyment for both members of the dyad. This possibility calls into question the conceptualization of co-rumination as a truly joint process in which both partners engage in presumably equitable discussion of their own problems.

To obtain a more nuanced and specific understanding of how essential features of co-rumination impact individuals, it may be helpful to deconstruct co-rumination according to whose problems are discussed. Illustratively, is it excessive discussion of one's own problems, rehashing a friend's problems, or both that impact adjustment? Further, is it the reciprocity or balance of problem discussion within a friendship that matters?

### **Co-rumination: Self- and Other-focused Problem Discussion Disentangled**

The terms self- and other-focused co-rumination are adopted to refer to discussion of personal problems and a friend's problems, respectively. While others have directly speculated about this distinction and even noted its omission as a limitation (e.g., Schwartz-Mette & Rose, 2012), most studies include only global assessments. Two previous studies (Calmes & Roberts, 2008; Waller & Rose, 2010; see also Waller & Rose, 2013) have separated self- and other-

focused co-rumination, but more empirical attention is required to determine whether the two are both conceptually and meaningfully distinct. Waller and Rose (2010) considered whose problems were central to discussion in mother-daughter dyads. Correlation between discussion of mother's and daughter's problems "was strong ( $r = .68$ ), but the scores were not redundant (one score accounted for less than half of the variance in the other score, specifically 46%)" (Waller & Rose, 2010, p. 490). A daughter's internalizing symptoms and relationship satisfaction were greatest if the pair co-ruminated about the mother's problems. Unlike mother-daughter relationships with an inherent hierarchical power differential, friendships should be more egalitarian. A follow-up analysis of this sample (Waller & Rose, 2013) revealed an extremely high correlation ( $r = .95$ ) between youths' excessive problem discussion of their own problems and those of their best friend.

In their study of college students' co-rumination across various relationships (i.e., roommate, parent, romantic partner, and best friend), Calmes and Roberts (2008) dissected co-rumination items to reflect whether the participant's (self) or friend's (other) problems were discussed. Unlike the study of mothers and daughters (Waller & Rose, 2010), conclusions did not support the separation of self- and other-focused co-rumination. Specifically, high correlations were found between the degree of self- and other-focused co-rumination ( $r = .66 - .91$ ). Not surprisingly, self- and other-focused co-rumination were most differentiated in hierarchical parent-child relationships ( $r = .66$ , similar to Waller & Rose, 2010). The correlation between self- and other-focused co-rumination within a best friendship was .87. A footnote (p. 580) states that "all analyses were conducted with each of the two subscales [self- and other-focused co-rumination] separately and yielded the same pattern of results" (Calmes & Roberts, 2008).

Both self- and other-focused co-rumination may result in internalizing symptoms, but through different mechanisms. In addition to generating social stress (Hankin et al., 2010), self-focused co-rumination could operate similarly to rumination but with the added impact of a friend's negative comments (see Smith-Schrandt et al., 2010). Specifically, self-focused co-rumination may exacerbate distress by: (1) sharpening focus on problems (see amplification hypothesis of repetitive thought: Ciesla & Roberts, 2007) and (2) precluding active problem-solving efforts and other appropriate approach behavior (e.g., Davis & Nolen-Hoeksema, 2000; Lyubomirsky, Kasri, Chang, & Chung, 2006; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Ward, Lyubomirsky, Sousa, & Nolen-Hoeksema, 2003). In a different manner, other-focused co-rumination could result in empathetic distress (Smith & Rose, 2011), especially considering one has less control over a friend's problems.

Although one study (Calmes & Roberts, 2008) suggests that division of self- and other-focused co-rumination may be unimportant, it is premature to accept this stance for several reasons. First, the lack of differentiation could be partially a result of measurement limitations. In this study, there were 64 very similarly-worded co-rumination questions (8 self- and 8 other-focused items for each of the four relationship types). It seems plausible, and perhaps likely, that participants found it difficult to consider, or remember, these conceptual distinctions when answering many questions. Second, because self- and other-focused co-rumination are separately observable behaviors, it seems reasonable to distinguish the two. Third, both self- and other-focused co-rumination could relate to outcomes in a cumulative fashion. Conversely, similar patterns of relationships may exist for both self- and other-focused co-rumination when examined separately, but simultaneous examination can evaluate if only one is driving relationships. Lastly, simultaneous examination allows for possible interaction effects, or

determining whether the balance of problem discussion matters. It is possible that differentiation is not material, but replication is needed before conclusions are drawn, especially considering limitations of examination of self- and other-focused co-rumination in separate analyses.

**Co-rumination Balance.** One key to understanding the phenomenon of co-rumination may be in considering how friends divide, or share, problem discussion. Principles of homophily explain that friends tend to be similar on various dimensions of adjustment (e.g., anxiety: Schwartz-Mette & Rose, 2012; body image: Paxton, Schutz, Wetheim, & Muir, 1999; depression: Stevens & Prinstein, 2005; deviancy: Dishion et al., 1997) through both selection (i.e., choosing similar friends similar to you) and socialization (i.e., becoming more like your friend over time) effects. Thus, within most friendship dyads, there are probably similar manners and degrees of problem discussion (for a review of self-disclosure reciprocity see Cozby, 1973), and most judge their close relationships to be reciprocal in terms of overall contribution and reward (e.g., Väänänen, Buunk, Kivimäki, Vahtera, & Koskenvuo, 2008), especially later in life (Li, Fok, & Fung, 2011). However, conversational control and dominance by one individual is recognized (e.g., Leaper, Tenenbaum, & Shaffer, 1999; Schwartz-Mette & Rose, 2009; Vangelisti, Knapp & Daly, 1990), and so co-rumination is surely imbalanced in some instances. The current study will be the first consideration of how co-rumination imbalance, or unequal maladaptive attention to problems, relates to adjustment.

Due to characteristic self-focus and preoccupation with their own distress (e.g., Woodruff-Borden, Brothers, & Lister, 2001; for review Ingram 1990), perhaps to the necessary exclusion of attention to others' distress, anxious and depressed individuals may monopolize co-ruminative conversation. Depressed individuals do tend towards self-referential comments (Mehl, 2006), such as interjecting unsolicited self-statements with strangers in a waiting room

(Jacobsen & Anderson, 1982). Observation (Schwartz-Mette & Rose, 2009) confirms that youth with internalizing symptoms re-direct discussion away from others towards themselves, often in a tangential and distracting manner (e.g., changing topics abruptly with irrelevant personal information). More than a feature of internalizing symptoms, extreme self-focus (see Mor & Winquist, 2002) and asymmetrical relationships (e.g., Liang, Krause, & Bennett, 2001; Väänänen, et al., 2008; Ybema, Kuijer, Buunk, Dejong, & Sanderman, 2001) can contribute to anxiety and depression. For example, daily increases in self-focus directly relate to greater negative affect (Mor et al., 2010), and vigorous social support can reinforce dependency and felt helplessness (Silverstein, Chen, & Heller, 1996).

Co-rumination's positive impact on friendship quality may be short-lived (e.g., Starr & Davila, 2009), perhaps due to unreciprocated and excessive problem discussion. Perceived imbalances in emotional and instrumental social support relate to relationship dissatisfaction and loneliness (see Li et al., 2011). A friend's conversational dominance has been related to feeling less supported (Schwartz-Mette & Rose, 2009). Moreover, excessive negativity and problem discussion is probably taxing, and individuals recognize others' frustration surrounding their continued need to talk (e.g., Nolen-Hoeksema & Davis, 1999). Conversational narcissism (i.e., "boasting", "glazing over" others' comments) is viewed as socially unattractive (Vangelisti et al., 1990), and inordinate other-focused co-rumination likely decreases friendship quality.

Exact measurement of self- and other-focused co-rumination and consideration of both can clarify the essential definitional ingredients (self, other, or both) of co-rumination and determine whether one-sided or reciprocated co-rumination matters. Further, different individual characteristics may predict self- and other-focused co-rumination.



## **Individual Differences in Self- and Other-focused Co-rumination**

Noting that all females do not co-ruminate to a similar degree, Rose (2002) suggested that individual characteristics would help explain the great variability in co-rumination. Yet, review of the literature reveals little understanding, or even speculation, of what specifically drives individuals to co-ruminate, other than they tend to be anxious or depressed females. Individuals actively select and engage their environment in such a way that character is maintained or strengthened (for a review of dynamic interactionism see Luyten, Blatt, Van Houdenhove, & Corveleyn, 2006). This means that traits associated with perseverative conversations will be reinforced over time, ensuring that the cycle of co-rumination and internalizing symptoms (Schwartz-Mette & Rose, 2012) strengthens and continues. The final purpose of the current study is to identify individual characteristics associated with self- and other-focused co-rumination. Clinical features of internalizing symptoms were selected that are interpersonal in nature, and might guide someone outward for this type of social feedback, as well as those that might predict a willingness to listen to excessive discussion of a friend's problems. Specifically, rumination, social perspective taking, negative problem orientation, perfectionism, and excessive reassurance seeking are considered. Further, co-rumination may serve as a behavioral mediator of these individual characteristics and adjustment.

**Rumination.** Because internal rumination is all consuming, some individuals may have trouble shifting, or following, discussion away from the topic of problems. Essentially, they may talk about the negative details of their problems because it is the only topic they ponder, and disengaging is difficult. As social forms of coping may or may not be functionally different from individual forms (for a review see Skinner et al., 2003), meaningful distinctions between rumination and co-rumination should be considered. Rumination is an individual, private,

cognitive process (for a review see Nolen-Hoeksema et al., 2008), which when verbalized becomes a process with the potential for social reinforcement. Additionally, co-rumination has a broader focus on problems and concerns, whereas depressive rumination mainly involves pondering negative affect (Rose, 2002). Empirical support for the discriminant validity of private rumination and co-rumination within friendships comes from factor analysis, which reveals two distinct constructs that are only “weakly” correlated ( $r = .31$  between latent variables) (Calmes & Roberts, 2008, p 586; also see Ciesla, Dickson, Anderson, & Neal, 2011).

Initially, co-rumination’s relationship with internalizing symptoms was thought to be explained by overlap with rumination (e.g., Calmes & Roberts, 2008; Rose, 2002). Strong evidence has since been provided that co-rumination predicts increases in internalizing symptoms independent of shared variance with rumination (Stone et al., 2011). Because rumination is associated with difficulty turning attention away from internal thought (e.g., Woodruff-Borden, Brothers, & Lister, 2001; for a review see Ingram, 1990), as well as neediness and dependency (Gorski & Young, 2002; Spasojevic & Alloy, 2001), it is predicted to be associated with self-focused co-rumination.

**Social Perspective Taking Ability.** One might become entangled in a co-ruminating friendship because of one's relational ability. Social perspective taking ability, the tendency and ability to consider another person’s viewpoint (Davis, 1983; Gehlbach, 2004), is one of the only individual characteristics previously associated with co-rumination (Smith & Rose, 2011). Social perspective taking is typically considered an adaptive skill associated with affective empathy, social adjustment, and high quality relationships (for a review see Underwood and Moore, 1982). However, social perspective taking ability is a “situated construct” strongly influenced by environmental factors (for a review see Gehlbach, 2004), and this prosocial skill

could also eventuate in more maladaptive behaviors, like co-rumination. It is thought that social perspective taking ability will relate to other-focused co-rumination, but not self-focused co-rumination.

**Negative Problem Orientation.** Co-rumination may be motivated by a negative attitude towards solving problems and perception of inability. According to the Intolerance of Uncertainty model (for reviews see Behar, DiMarco, Hekler, Mohlman, & Staples, 2009; Dugas, Gagnon, Ladouceur, & Freeston, 1998), anxious individuals find ambiguous events to be upsetting, and chronically worry, inaccurately believing they will prevent or prepare for negative events (positive beliefs about worry). This recipe culminates in a negative problem orientation which includes (1) lack of confidence in problem solving ability, (2) perceived threat in problems, (3) low frustration tolerance for handling problems, and (4) pessimism about outcomes (Koerner & Dugas, 2006). A negative problem orientation is an empirically supported maintenance factor for anxiety and depression (for a review see Behar et al., 2009). As part of the motivational stage of problem solving (D’Zurilla & Nezu, 1990), a negative problem orientation may cause one to seek others’ opinions for unnecessary review of problematic situations (self-focused co-rumination); conversely, it may lead one to shy away from providing assistance to others (other-focused co-rumination).

**Perfectionism.** The meticulous attention to problem details, causes, and consequences, characteristic of co-ruminative dialogue, may stem from paralyzing concern over mistakes. Perfectionism is a cognitive-behavior set consisting of two dimensions, namely strivings and concerns (for reviews see Enns & Cox, 2002; Stroeber & Otto, 2006; see factor analyses supporting two dimensions: Dunkley, Blankstein, Zuroff, Lecce, & Hui, 2006; Frost, Heimberg, Holt, & Mattia, 1993). Perfectionistic striving, or adherence to stringently defined and high

personal standards, is associated with achievement and sometimes positive adjustment. On the other hand, perfectionistic concern includes over-critical self-evaluation and excessive attention to detail due to fear of mistakes and is linked to psychopathology. It is not the reach for excellence that is maladaptive, so much as the distress and functional impairment (e.g., indecisiveness, avoidance) associated with perfectionistic concern (see Enns, Cox, & Clara, 2002).

Perfectionism is implicated in various difficulties and is related to comorbidity, making it attractive for its transdiagnostic explanatory power (for reviews see Egan, Wade, & Shafran, 2011; Shafran & Mansell, 2001). Perfectionistic tendencies are related to anxious and depressed symptoms and also suicidal ideation, OCD, panic, disordered eating, and PTSD. Characterized as the inability to be satisfied (e.g., Besser, Flett, & Hewitt, 2004), perfectionism could be associated with unnecessarily comprehensive attempts to understand problems. As such, perfectionism is predicted to be related to self-focused co-rumination. However, the scrupulous and detailed perfectionists might also appreciate and engage in dissection of their friends' predicaments.

**Excessive Reassurance Seeking.** Co-ruminative engagement may be triggered by a need for comfort from others to assuage emotional distress. Excessive reassurance seeking is an often maladaptive coping strategy (e.g., Joiner, Katz, & Lew, 1999) that involves querying others to assuage doubts about lovability (e.g., “do you love me?” Potthoff, Holahan, & Joiner, 1995), social evaluative concerns (“is there anything wrong with me?” Cogle, Fitch, Fincham, Riccardi, Keough, & Timpano, 2012), or general threats (e.g., “is everything going to be OK?” Cogle et al., 2012). However, encouragement provided is not effective in alleviating concerns (e.g., Shaver, Schachner, & Mikulincer, 2005), perhaps because less reassurance is provided at

each subsequent request. Reassurance is repeatedly sought, often to the point of interpersonal rejection (for a review see Evraire & Dozois, 2011).

With transdiagnostic relevance, excessive reassurance seeking is mostly studied in regards to depression but is also related to anxiety (e.g., Joiner & Metalsky, 1995), including as a method to cope with intrusive OCD thoughts (e.g., Parrish & Radomsky, 2010) and hypochondriac concerns (Salkovskis & Warwick, 1986). Longitudinal evidence confirms excessive reassurance seeking as a prospective predictor of depression (e.g., Davila, 2001; Joiner & Metalsky 2001; Potthoff et al., 1995; Shaver et al., 2005) and generalized and social anxiety (Cogle et al., 2012). Meta-analysis (Starr & Davila, 2008b) confirms its relation to depressive symptoms (effect size = .32) and interpersonal rejection (effect size = .32). Supporting a likely relationship with co-rumination, excessive reassurance seeking is associated with intolerance of uncertainty (e.g, Cogle et al., 2012), rumination (Weinstock & Whisman, 2007), and reliance on others (sociotropy/dependent personality: e.g, Beck, Robbins, Taylor, & Baker, 2001; Birgenheir, Pepper, & Johns, 2010; Davila, 2001). The inclination, desire, or need for repeated reassurance about one's problems should manifest in self-focused co-rumination.

### **Co-rumination Across Development and Gender Differences**

**Age.** Developmental studies of children and adolescents show that co-rumination increases and the gender gap widens across adolescence (Rose, 2002; Rose et al., 2007). Although co-rumination is not a process limited to youth, much about adult co-rumination is still unknown and limited to a handful of studies (Bouchard & Shih, 2013; Byrd-Craven et al., 2008; Byrd-Craven et al., 2011; Calmes & Roberts, 2008; Ciesla et al., 2011; Haggard, Robert, & Rose, 2011; Rudiger & Winstead, 2013; White & Shih, 2012). As expected, adult co-rumination related to greater friendship quality and internalizing symptoms in one study (Calmes & Roberts,

2008). However, another college student sample found co-rumination related to daily depressed mood and interpersonal controllable stress, but not to depressive symptoms (Bouchard & Shih, 2013; White & Shih, 2012). Two laboratory studies revealed that physiological stress reactions are related to characteristics of co-rumination observed during laboratory problem discussion (Byrd-Craven et al., 2008; Byrd-Craven et al., 2011). Lastly, it has been found that co-rumination is related to binge drinking (Ciesla et al. 2011) and disordered eating (Rudiger & Winstead, 2013), and occurs in adult co-worker relationships (Haggard et al., 2011). Limited empirical examination merits expanded study of co-rumination in adult populations.

**Gender.** Co-rumination is typically assessed in same-gender friendships and is most characteristic of female friendships, probably due to their interpersonal nature and greater tendency to engage in dyadic personal conversations (e.g., Benenson, Apostoleris, & Parnass, 1997; Hankin, Mermelstein, & Roesch, 2007). Research has consistently shown that females co-ruminate more than males in all stages of life (e.g., Calmes & Roberts, 2008; Rose, 2002; Rose et al., 2007; Schwartz-Mette & Rose, 2012; Stone et al., 2011; Tompkins et al., 2011). Most studies find gender differences in co-rumination that are medium-sized ( $r_{\text{effect size}} = .27 - .37$ ; Stone et al., 2010).

Gender differences in internalizing symptoms and friendship quality have been mediated by co-rumination in several studies (Calmes & Roberts, 2008; Rose, 2002). While most studies consider mediation, moderation of co-rumination has also been suggested with mixed findings as to whether the link between co-rumination and adjustment is stronger for girls (e.g., Rose et al., 2007) or boys (Hankin et al., 2010). Stone and colleagues (2011) tested both possibilities and found significant mediation but not moderation. Thus, how females discuss problems is one pathway to greater intimacy in friendship and increased emotional distress (for a review see Rose

& Rudolph, 2006). Similar findings suggest that when they engage in co-rumination, both genders are susceptible to the impact of excessive problem discussion on depressed mood (White & Shih, 2012).

Gender often plays a complicated role in co-rumination studies. For example, co-rumination with a co-worker about abusive supervision at work seems to impair females' work-life balance, but be related to less depression and more job satisfaction for men (Haggard et al., 2011). Also, co-rumination appears to have an opposite effect on the drinking behavior of male and female college students; it is related to more alcohol consumption (and binge drinking) for women and less for men (Ciesla et al., 2011). For women, drinking might reduce social and emotional inhibition, thereby increasing the likelihood for co-rumination. For men, drinking may serve an escapist function, and as such be antithetical to co-rumination. To fully understand the landscape of co-rumination, gender should routinely be included in analyses.

### **Current Study**

The overarching purpose of the current study was to provide a nuanced understanding by examining a clinical model of self- and other-focused co-rumination (Figure 1). Contributions to the literature include: (1) needed replication of relationships between co-rumination and adjustment in adults, (2) including the first consideration of social anxiety, (3) simultaneous consideration of self- and other-focused problem discussion, as well as the relative balance of the two, 4) identification of individual characteristics (i.e., rumination, social perspective taking ability, negative problem orientation, perfectionism, and excessive reassurance seeking,) associated with self- and other-focused co-rumination, and investigation of meditational pathways from individual characteristics to internalizing symptoms and friendship quality through co-rumination.

***Research Question 1: Do previous findings regarding co-rumination in adolescent friendships replicate with an adult sample?***

Hypothesis 1a: Women will report greater co-rumination, internalizing symptoms, and friendship quality than men.

Hypothesis 1b: Co-rumination will be positively correlated with friendship quality, as well as depressive and anxious symptoms.

***Research Question 2: How does social anxiety relate to co-rumination?***

Hypothesis 2a: Co-rumination will be negatively correlated with social anxiety.

Hypothesis 2b: The relationship between co-rumination and depression and anxiety will be stronger when social anxiety is statistically controlled.

Hypothesis 2c: The negative association between social anxiety and co-rumination will be stronger for males than females.

***Research Question 3: Does differentiation of self- and other-focused co-rumination, and consideration of the balance between the two, improve understanding of co-rumination as it relates to adjustment?***

Hypothesis 3a: Self- and other- focused co-rumination will be positively correlated, but factorially distinct.

Hypothesis 3b: The degree of imbalance in the direction of other-focused co-rumination will be negatively correlated with perceived friendship quality.



Hypothesis 3c: Anxiety and depression will be associated with imbalance in the direction of self-focused co-rumination.

Hypothesis 3d: Social anxiety will be associated with imbalance in the direction of other-focused co-rumination.

***Research Question 4: Do individual characteristics relate to self- and other-focused co-rumination to explain adjustment?***

Hypothesis 4a: Social Perspective Taking Ability will predict greater other-focused co-rumination.

Hypothesis 4b: Rumination will predict greater self-focused co-rumination.

Hypothesis 4c: Threat-related reassurance-seeking will predict greater self-focused co-rumination.

Hypothesis 4d: A negative problem orientation will predict greater self- , and lower other-focused, co-rumination.

Hypothesis 4e: Perfectionism will predict both greater self- and other-focused co-rumination.

Hypothesis 4f: Self- and other-focused co-rumination will mediate the relationships between individual characteristics and adjustment outcomes.

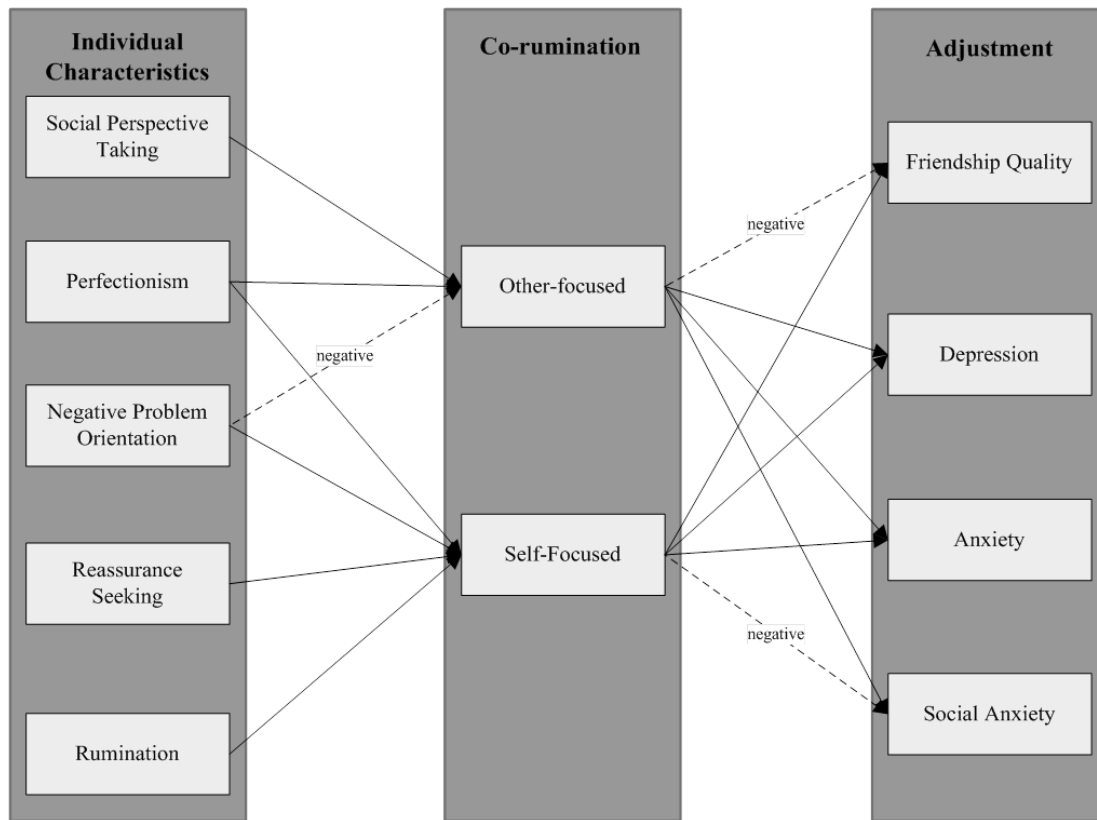


Figure 1. Proposed Model. Predictions of negative associations represented by dashed lines.

## Method

### Participants

The final sample ( $N=601$ ) was largely female ( $N=474$ , 79%) and recruited from a large metropolitan university in the southeastern United States. The majority of participants (90%) were recruited from the psychology department's undergraduate participant pool. Additionally, some participants (10%) were recruited through other departments including business and public health. The average age of participants was 20.62 years ( $SD = 3.80$  years) with a range of 18 to 54, and a modal age of 18, and the majority (76%) were 21 years old or younger. Most participants were Caucasian (58%); other ethnicities represented included: Hispanic 14%), Black/African American (11%), Other/Multi-Racial (10%), Asian/Pacific Islander (7%), and American Indian/Alaska Native (< 1%). Academic year was reported: Freshman (37%), Sophomores (13%), Juniors (25%), Seniors (19%), and "Fifth year or beyond" (6%).

It should be noted that an additional 35 participants were excluded from the final sample because they provided insufficient or invalid data. Specifically, 11 participants (2%) did not provide enough data (i.e., did not complete co-rumination measures) to be included in any of the main analyses, and 24 participants (3.5%) answered one or more validity questions incorrectly, which were embedded in the survey to assess random responding (see Appendix A).

### Measures

**Demographics, Friendship, and Communication.** After reporting age, gender, ethnicity, academic year, and major, participants provided the first name of their best (same-gender, non-romantic) friend (see Appendix A). Although cross-gender friendships may be of

interest, they are less common. For example, Cillessen and colleagues (2005) allowed for cross-gender friendship nominations, which accounted for approximately 8% of their sample (11/138 pairs), but had to eliminate these pairs from analyses due to the small number. Thus, cross-gender friendships were not considered. Romantic friendships may be quite different from non-romantic friendships so were not considered. The best friend's name was included in all friendship-related measures to increase consistent responding with the same friendship in mind.

Participants estimated their number of "close friends" and responded to a series of questions (see Appendix A) describing their best friendship including: length of friendship, physical proximity (i.e., residence in same city), length of friendship, and frequency of in-person contact. Participants reported on typical method of communication with their best friend (e.g., face-to-face, digital).

**Co-rumination.** Co-rumination within friendships was measured with a revision of the Co-Rumination Questionnaire (CQ; Rose, 2002). The original survey consists of 27 items, with three items to assess each of nine content areas: (1) frequently discussing problems, (2) discussing problems instead of engaging in other areas, (3) focal individual encourages friend to discuss problems, (4) friend encourages focal individual to discuss problems, (5) discuss the same problem repeatedly, (6) speculation about problem causes, (7) speculation about problem consequences, (8) speculation about parts of the problem that are not understood, and (9) focus on negative feelings. Although items cover content in nine areas, exploratory factor analysis has supported *one* strong factor reflecting co-rumination (Rose, 2002).

The measure asks participants to "think about the way you usually are with your best friend" and to indicate how well statements describe them. Response options range from 1 = "Not At All True" to 5 = "Really True". In this version, instructions were changed to "think about

the way you are with [insert **NAME** of best friend provided by participant] when you TALK about problems”. To capture all contexts, or manners, of problem discussion, "TALK" was defined for participants as "communication in person, on the phone, via text, or through any digital means".

Because 27 items separated into self- and other-focused co-rumination would have been unwieldy (54 items), the shortened version of the CQ consisting of 9 items, which has been successfully used by others (e.g., Haggard et al., 2011; Stone et al., 2011; Waller & Rose, 2010; see Hankin et al., 2010 for empirical support for the shortened version), was employed. Following the co-rumination questionnaire adaptation of Waller and Rose (2010), items were altered to separate self- and other-focused problem discussion. For example, the question stem “when we talk about a problem that one of us has...” was transformed into two items 1) “when we talk about a problem that **I** have”, and 2) “when we talk about a problem [**NAME** of best friend] has.” The two “encouragement of problem discussion” items yielded two sets of two identical items when adjusted in above manner to reflect self- and other-focused co-rumination. Thus, the final revised version for this study (see Appendix B) included 16 items ( $\alpha = .94$ ), 18 items minus two duplicates related to encouragement of problem discussion, reflected both self- (8 items,  $\alpha = .90$ ) and other-focused (8 items,  $\alpha = .91$ ) co-rumination. These scores are hereafter referred to as self-and other-focused co-rumination. Additionally, a combined co-rumination score was calculated by averaging a participant's responses to self- and other-focused items (16 items,  $\alpha = .94$ ).

**Co-rumination Balance.** The perceived degree of dyadic balance of co-rumination was assessed by simultaneous examination of self- (8 items) and other-focused (8 items) co-rumination (i.e., interaction term of self x other). An interaction term was deemed the optimal

statistical approach to capturing co-rumination balance and fully capture both friends' degree of co-rumination, and the difference between the two. However, because this is the first known study of co-rumination balance, two alternative measurements were used to enhance examination and understanding. First, a discrepancy score between self- and other-focused co-rumination was created (i.e., mean of 8 self items - mean of 8 other items). While a discrepancy score does not reflect the overall degree or amount of co-rumination (e.g., 2 friends equally high in co-rumination have a discrepancy score of 0, as do 2 friends equally low in co-rumination), it is an easily understandable descriptive statistic which can supplement understanding. Second, an additional question served as a more direct (face-valid) assessment of perceptions of time spent in self- versus other-focused co-rumination. Specifically, participants were asked “Now that you have told us about how you and [NAME of best friend] discuss problems, please think carefully about whose problems are typically the focus of problem discussion. Select the option that best describes you and [NAME of best friend]”. As a measure of co-rumination *balance* does not exist, the following response options were based on an existing measure of general relationship equity with an 8-point scale excluding an option of total balance (Walster Global Measure of Participant’s Perceptions of Inputs, Outcomes, and Equity/Inequity; see Larson, Hammond & Harper, 1998). The option of total balance was omitted to encourage differentiation. Participants' responses to this item are referred to as the direct measure of co-rumination balance.

- (4) We **almost always** focus on MY problems.
- (3) We focus **much more** on MY problems.
- (2) We focus **more** on MY problems.
- (1) We focus **slightly more** on MY problems.
- (-1) We focus **slightly more** on [NAME of best friend]’s problems.

(-2) We focus **more** on [NAME of best friend]'s problems.

(-3) We focus **much more** on [NAME of best friend]'s problems.

(-4) We **almost always** focus on [NAME of best friend]'s problems.

**Depression and Anxiety.** The 14-item depression (e.g., "I felt that life wasn't worthwhile") and 14-item anxiety (e.g., "I felt scared without any good reason") subscales of the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995; see Appendix C) ask participants to rate each item on a 4-point Likert scale (0 = "*did not apply to me at all*" to 3 = "*applied to me very much, or most of the time*"). Instructions were altered slightly to reference symptoms experienced in the past *two* weeks (rather than one week). The DASS has been well-validated in clinical and community samples with demonstrated reliability and convergent validity with similar measures, including the BDI and BAI (Brown, Chorpita, Korotitsch, & Barlow, 1997; Crawford, Cayley, Lovibond, Wilson, & Hartley, 2011; Lovibond & Lovibond, 1995). In the current study, internal consistency for depression ( $\alpha = .95$ ) was excellent, and internal consistency for anxiety ( $\alpha = .87$ ) was satisfactory.

**Social Anxiety.** The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item self-report measure of social anxiety, specifically fear and avoidance of social situations because of worry about social evaluation or interpersonal rejection (e.g., "when mixing socially, I am uncomfortable", see Appendix D). Response options are on a 5-point Likert scale (1 = "*not at all characteristic or true of me*" to 5 = "*extremely characteristic or true of me*"). The 20-item scale demonstrated excellent internal consistency in the present study ( $\alpha = .93$ ).

**Friendship Quality.** Friendship quality was assessed via the Quality of Relationships Scale (QRI; Pierce, Sarason, & Sarason, 1991) which consists of three dimensions of relationship quality: conflict, support, and depth (see Appendix E). Following Calmes and Roberts (2008),

only the 7-item support and 6-item depth subscales were used to assess friendship quality. Support reflects the extent to which one can rely on one's friend in a variety of situations (e.g., "To what extent can you count on your friend to help you if a family member very close to you died?"), and depth measures the value of and commitment to the relationship ("How significant is this relationship in your life?"). Participants are asked to rate each item on a 4-point Likert scale (1 = "not at all" to 4 = "very much"). Satisfactory internal consistency was obtained in this study ( $\alpha = .87$ ).

**Rumination.** The Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991) consists of 25 items which assess an individual's tendency to ruminate when feeling depressed on a 4-point Likert scale (1 = "almost never" to 4 = "almost always") (see Appendix F). It includes items that are focused on the self (e.g., "why am I the only one with problems"), symptoms (e.g., "I am always tired"), and causes and consequences of depressed mood (e.g., "I won't be able to work because I feel so badly"). Excellent internal consistency ( $\alpha = .96$ ) was demonstrated in the current study.

**Social Perspective Taking Ability.** The Interpersonal Reactivity Index (IRI; Davis, 1983) is a measure of dispositional empathy (see Appendix G). Following Smith and Rose (2011), social perspective taking ability was measured with the 7-item Perspective Taking subscale regarding the tendency to infer the psychological viewpoint of others (e.g., "I sometimes try to understand my friends better by imagining how things look from their perspective"). Responses are on a 5-point Likert scale (1 = "does not describe me well" to 5 = "describes me very well"). Internal consistency was acceptable ( $\alpha = .83$ ).

**Negative Problem Orientation.** The Negative Problem Orientation Questionnaire (NPOQ; Robichaud & Dugas, 2005) is a 12-item measure of negative beliefs about problems and



problem-solving ability (see Appendix H). Specifically, a negative problem orientation is the tendency to view problems as threatening (e.g., “I see problems as a threat to my well-being”), to doubt problem-solving ability (e.g., “I often doubt my capacity to solve problems”), and be pessimistic about problem resolutions (e.g., “My problems often seem insurmountable”). Participants were asked to rate each item on a 5-point Likert scale (1 = “*not at all true of me*” to 5 = “*extremely true of me*”). Good internal consistency was demonstrated for the current study ( $\alpha = .93$ ).

**Perfectionism.** The 35-item Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1993) assesses perfectionism and includes six factors: setting high personal standards (PS), concern over mistakes (CM), doubts about actions (DA), parents’ expectations (PE), parents criticizing for mistakes (PC), and organization/neatness (O, which is not included in total score calculation). Following Stoeber and Jansen (2011), perfectionistic concerns were assessed via a 9-item concern over mistakes (CM; e.g., “I should be upset if I make a mistake”) and 4-item doubts over actions (DA; e.g., “I usually have doubts about the simple everyday things I do”) subscales (see Appendix I). Parents’ role is less relevant to the current study so PE and PC subscales were excluded. Participants were asked to select the option that best reflects their opinion on a 5-point Likert scale (1 = “*strongly disagree*” to 5 = “*strongly agree*”). Internal consistency was good ( $\alpha = .92$ ).

**Excessive Reassurance Seeking.** The Threat-related Reassurance Seeking Scale (TRSS; Cogle et al., 2012) is an 8-item measure of reassurance-seeking regarding general threats (4 items, e.g., “do you frequently seek reassurance from others as to whether something bad is going to happen?”) and social evaluation threats (4 items, e.g., “do you need reassurance from others that there is nothing wrong with you [for example, your appearance, behavior, personality,

or intelligence]?”; see Appendix J). Participants were asked “For the following questions, please select the answer most appropriate to you” with seven Likert-type options (1 = “no, not at all” to 7 = “yes, very much”). Internal consistency for reassurance seeking was demonstrated in the current study ( $\alpha = .94$ ).

## **Procedure**

Participants were mostly recruited via the undergraduate research pool online system. A small fraction of participants was recruited through classroom visits (i.e., business department) and department web pages (i.e., public health). Participants had to report being 18 years of age or older and fluent in English. After reviewing study information (see Appendices K and L), participants provided consent by clicking a button acknowledging their agreement to participate.

At the beginning of the online survey, the topic of friendships was identified and it was explained that questions would ask participants to think about their best friend (see Appendix A). Survey questions were presented in a standard order for each participant (see Appendix M for summary of measures): demographics/friendship/communication, friendship quality, co-rumination, individual characteristics/predictors, direct question related to co-rumination balance, and internalizing symptoms, followed by several exploratory measures that were part of a larger research study. Friendship quality was assessed first before participants reflected on their problem discussion with their best friend. It was reasoned that reflecting on problem discussion and whose problems were most often the focus of discussion could influence reports of friendship quality. The one question serving as a direct measure of co-rumination balance was separated from the primary co-rumination items. This was done so the direct assessment could be used as a validity check and compared to responses on the measures of self- and other-focused co-rumination. Internalizing symptoms were presented last so that any unexpected distress would

not impact responses to earlier questions. Lastly, participants completed additional survey measures that were part of a larger study.

Participants were informed that their responses would be anonymous. As an incentive for participation, extra credit was provided to students. Although the collection of names was necessary for the award of extra credit, survey data were de-identified. Distress resulting from study participation was not expected. However, at survey completion, participants were provided with an extensive list of local mental health resources. In consideration of participant privacy, this presentation of resources was deemed appropriate.

## Results

Because the sample was largely female, analyses were conducted based on the full sample ( $N = 601$ ) as well as an equal gender sample (all 127 participating males and random sample of 127 females). However, no meaningful differences emerged. Therefore, results are based on the full sample. Results are presented in five sections:

- (1) descriptive statistics,
- (2) tests of gender differences (Hypothesis 1a)
- (3) intercorrelations (Hypotheses 1b, 2a - 2c),
- (4) discrimination of self- and other-focused co-rumination, including exploratory factor analysis (Hypothesis 3a) and a direct measure of balance (preliminary test of Hypotheses 3b - 3d)
- (5) a model of co-rumination that includes: individual differences in self- and other-focused co-rumination (Hypotheses 4a - 4e), the effects of self- and other-focused co-rumination, and their balance, on friendship quality and internalizing symptoms (formal test of Hypotheses 3b - 3d), and indirect effects of individual characteristics on adjustment through co-rumination (Hypothesis 4f).

### Descriptive Statistics

**Means and Standard Deviations.** Overall means (after reverse scoring when required) and standard deviations for each study variable are presented in Table 1. Most variables were normally distributed with the exception of three: friendship quality (skew = -1.43, kurtosis =

3.25), anxiety (skew = 1.51, kurtosis = 1.67), and depression (skew = 1.42, kurtosis = 2.02).

These skewed distributions are not unexpected because best friendships are likely high in quality (negative skew) and many community sample participants report few internalizing symptoms (positive skew). Log transformations reduced skew and kurtosis to acceptable levels below 1.00 (friendship quality: skew = 0.58, kurtosis = .19, anxiety: skew = 0.93, kurtosis = -.16, depression: skew = 0.82, kurtosis = -.10). Conducting the analyses with the transformed values did not alter the results. Thus, all analyses were performed with the original (non-transformed) data to ease interpretation.

**Severity and Comorbidity of Internalizing Symptoms.** The average total of depressive symptoms reported by participants (Range = 0 - 41,  $M = 7.20$ ,  $SD = 8.64$ ) falls in the "Normal" range (0 - 9), and average anxiety symptoms ( Range = 0 - 31,  $M = 5.58$ ,  $SD = 5.99$ ) appear "Normal" (0 - 7; Lovibond & Lovibond, 1995). Table 2 includes the number of participants considered in various severity combinations of anxiety and depression. The measure of social anxiety used does not have the standardized ranges of symptom severity, but the average level of social reported by participants (Range = 20 - 95,  $M = 45.72$ ,  $SD = 14.82$ ) is below the clinical cut-off (56) indicative of social phobia (Peters, 2000). Approximately 26% ( $n = 155$ ) of participants reported levels of social anxiety greater than 56 that would indicate possible social phobia.

**Best Friendships in Young Adulthood.** Because participants reported on co-rumination with their best friend, descriptive information about that friendship was considered. The majority of participants (64%) reported between two and five "close friends" ( $n = 426$ ). Most participants (92%,  $n = 551$ ) had known their best friend for at least one year. Most participants (67%,  $n =$

404) typically see their friend *in person* at least monthly, and many (35%,  $n = 120$ ) reported routinely seeing their best friend on a daily basis.

**Frequency and Methods of Communication with Best Friends.** Participants were asked to rank (from 1 - 8) how often they communicated with their best friend in various manners. The most frequent mode of communication was "texting" ( $M = 2.06$ ,  $SD = 1.33$ ) followed by: in person ( $M = 2.92$ ,  $SD = 2.07$ ), on the phone ( $M = 3.01$ ,  $SD = 1.44$ ), "online messaging (e.g., Facebook)" ( $M = 3.85$ ,  $SD = 1.51$ ), "online chatting" ( $M = 4.73$ ,  $SD = 1.47$ ), "video chatting" ( $M = 5.20$ ,  $SD = 1.90$ ), "e-mail" ( $M = 5.98$ ,  $SD = 1.51$ ), and lastly "while gaming" ( $M = 6.89$ ,  $SD = 1.87$ ).

### **Gender Differences**

Ethnicity-related mean differences were examined and non-significant. Gender differences in study variables are presented in Table 1. There were no gender differences in internalizing symptoms, social perspective taking, perfectionism, or rumination. Compared to men, women reported significantly higher co-rumination, reassurance seeking, and friendship quality, as well as a more negative problem orientation. Thus, Hypothesis 1a was partially supported because women did report more co-rumination and a higher friendship quality, but they did not indicate increased internalizing symptoms.

### **Correlations among Co-rumination, Individual Characteristics, and Adjustment**

Correlations among co-rumination, individual characteristics, and adjustment variables are presented in Table 3. In this section, relationships with combined, rather than self- and other-focused, co-rumination are considered. Hypothesis 1b was supported in that co-rumination was positively correlated with depression ( $r(586) = .10$ ), anxiety ( $r(586) = .15$ ), and friendship quality ( $r(601) = .41$ ), although correlations with internalizing symptoms were weak.

Hypothesis 2a, that social anxiety would be negatively correlated with co-rumination, was not supported. In fact, co-rumination was positively correlated with social anxiety ( $r(592) = .10$ ). Hypothesis 2b predicted that the relationship between co-rumination and anxiety and depression would be stronger when controlling for social anxiety, due to the anticipated, but disconfirmed, negative correlation between social anxiety and co-rumination. However, partial correlations revealed that relationships between co-rumination and anxiety ( $r(586) = .12, p < .01$ ) and co-rumination and depression ( $r(586) = .06, NS$ ) were weaker when social anxiety was controlled. In fact, the correlation between co-rumination and depression became statistically non-significant. Hypothesis 2c predicted that a stronger negative relationship would be found between co-rumination and symptoms of social anxiety among men than among women. However, the correlation between socially anxious symptoms and co-rumination among men ( $r(124) = .06, NS$ ) was not statistically different ( $z = .49, NS$ ) from the correlation between social anxiety and co-rumination among women ( $r(468) = .11, p < .05$ ). Thus, support was not obtained for predictions about social anxiety and co-rumination (Hypotheses 2a - 2c).

Although no predictions were made about shared variance between anxiety and depression, partial correlations were conducted demonstrating the relationship between co-rumination and specific internalizing symptoms while controlling for comorbid internalizing symptoms. The correlation between co-rumination and anxiety symptoms ( $r(586) = .15$ ) was reduced but still significant when depressive and socially anxious symptoms were controlled ( $r(581) = .10, p < .05$ ). The correlation between co-rumination and depressive symptoms ( $r(586) = .10$ ) was reduced to statistical non-significance when anxious and socially anxious symptoms were controlled ( $r(581) = .00, NS$ ). Similarly, the correlation between co-rumination and

symptoms of social anxiety ( $r(592) = .10$ ) was reduced to statistical non-significance when depressive and anxious symptoms were controlled ( $r(581) = .03$ , NS).

### **Discrimination of Self- and Other-focused Co-rumination and Co-rumination Balance**

As expected, self- and other-focused co-rumination were highly correlated ( $r(601) = .82$ ). The correlation between self- and other-focused co-rumination among males ( $r(127) = .88$ ) was significantly greater ( $z = -2.63$ ,  $p < .01$ ) than the correlation between the two among females ( $r(474) = .80$ ). Additionally, study variables were similarly correlated to self- and other-focused co-rumination (see Table 3).

**Exploratory Factor Analysis.** To examine predicted empirical distinction between self- and other-focused co-rumination, an exploratory factor analysis (EFA) was conducted. While two factors were predicted (Hypothesis 3a), exploratory analysis was selected over a confirmatory approach as a more conservative examination of this new idea. Self-focused co-rumination items (8 items) were expected to load on a "self" factor and other-focused items (8 items) on an "other" factor. However, EFA allowed items to load freely onto factor(s) to explain the maximum amount of variance.

Principal components factor analysis with a direct oblimin (oblique) rotation revealed two correlated factors ( $r = .62$ ) which together accounted for 62.73% of variance in the co-rumination items. Communalities ranged from .43 to .73. The primary factor accounted for the majority of variance in co-rumination items (54.68%, eigenvalue = 8.75,  $\alpha = .95$ ), and a second factor accounted for an additional 8.05% of variance (eigenvalue = 1.29,  $\alpha = .85$ ). This secondary factor is interpreted cautiously; eigenvalues greater than 1.00 are often interpreted according to Kaiser's strategy (see Raïche, Walls, Magis, Riopel, & Blais, 2013), but the relative strength of the secondary factor (compared to the primary factor) makes interpretation tentative.



A split half analysis revealed a virtually identical factor structure for each sample and results did not differ according to gender.

Standardized factor loadings from the structure matrix are presented in Table 4. Contrary to expectations (Hypothesis 3a), items did not load onto predicted self- and other-focused factors. In contrast, items seemed to load according to item content without regard for the self/other distinction. In fact, in all instances the self- and corresponding other- item loaded on the same factor, and with very similar factor loadings (e.g., self item 8 "we talk about how bad I feel": factor loading = .74 and corresponding other item 16 "we talk about how bad [name of best friend] feels ": factor loading = .73). Most items (12 of 16) loaded onto a primary co-rumination factor with the highest loading items related to "problem comprehension", or detailed discussion of the causes, negative consequences, and less understood parts of problems (self items 5-7 and other items 13-15). Items related to frequency of problem discussion (self item 1 and other item 9) and interruption of planned activities (self item 2 and other item 10) loaded on to the much smaller secondary "frequent interference" factor (4 items).

This exploratory factor analysis provides evidence contrary to Hypothesis 3a and suggests there is no empirical distinction between self- and other-focused co-rumination. The next sections examine co-rumination balance and how it relates to outcomes.

**A Direct Measure of Co-rumination and Exploration of Balance.** To begin to consider co-rumination balance, descriptive analyses of co-rumination balance were conducted using a discrepancy score (i.e., mean of 8 self items - mean of 8 other items) and the direct measure of co-rumination (one item with option of total balance omitted). A participant's discrepancy score could range between +4.00 (maximum self-focused [5.00]- minimum other-focused co-rumination [1.00]) and -4.00 (minimum self-focused [1.00]- maximum other-focused

co-rumination [5.00]). The absolute value of the discrepancy score represents the degree of co-rumination imbalance in the friendship and the sign indicates the direction of imbalance (positive = more self-focused, negative = more other-focused). The mean co-rumination discrepancy score was  $-.23$  ( $SD = .56$ ) indicating that participants perceived their friendships as only slightly imbalanced towards greater co-rumination of their friend's problems (obtained range =  $-3.00 - 1.25$ ). In fact, 89% of discrepancy scores had an absolute value less than or equal to 1.00, with most of the larger discrepancies being in the direction of greater other-focused co-rumination (10% of discrepancy scores  $< -1.00$ , and only 1%  $> +1.00$ ).

The direct measure of co-rumination balance (one item) also had a possible range of  $-4.00$  (mostly other-focused problem discussion) to  $+4.00$  (mostly self-focused problem discussion), but the response option of equal problem discussion ( $0.00$ ) was omitted. The mean of co-rumination balance ( $M = -.18$ ,  $SD = 1.58$ ) was similar to the mean discrepancy score. The correlation between the co-rumination discrepancy score and a participant's response to the single direct co-rumination balance item was  $.21$  ( $p < .001$ ). Similar to the discrepancy score, the direct item of co-rumination balance indicated that, in general, participants perceived their friendships as very slightly more focused on their best friend's problems. However, there was a greater range of responses for the direct item (obtained range =  $-4.00 - 4.00$ ) with more participants (27%) indicating a more definitive imbalance (absolute value  $> 1.00$ ).

A one-way between groups multivariate analysis of variance (MANOVA) was conducted to examine mean level differences in individual characteristics and adjustment variables according to the one-item measure of co-rumination balance. Based on their response to the direct item of co-rumination balance, participants were grouped into "other-focused" (less than or equal to  $-1.00$ ), "balanced" (between  $-1.00$  and  $1.00$ ), and "self-focused" (greater than or equal to

1.00) groups. There was a significant multivariate difference among co-rumination balance groups ( $\Lambda=.95$ ,  $F(4, 3760)=22.16$ ,  $p<.00$ ), and follow-up univariate analyses indicated significant group differences in every individual characteristic and adjustment variable (see Table 5). Post hoc Tukey comparisons provided preliminary support for hypotheses related to co-rumination balance (Hypotheses 3b and 3c). Specifically, the other-focused group rated their friendship quality as significantly lower in comparison to balanced friendships, and participants who recognized their friendship as more self-focused reported greater anxiety and depression than balanced and other-focused friendships. It was thought that symptoms of social anxiety would relate to more other-focused problem discussion (Hypothesis 3d). However, similar to generalized anxiety, it was the self-focused group who reported greater symptoms of social anxiety. In addition, the participants in self-focused friendships reported significantly more rumination, perfectionism, reassurance seeking, and negative problem orientation than those in balanced and other-focused friendships, as well as significantly less social perspective taking. These results are based on groupings derived from one direct item related to balance of problem discussion. The following path analysis, which includes consideration of the interaction of continuous measures of self- and other-focused co-rumination, is a more statistically sophisticated approach to the question of the impact of co-rumination balance that considers both degree of imbalance and severity of co-rumination.

## **A Clinical Model of Self- and Other-focused Co-rumination**

**Analytic Procedure.** Path modeling (Mplus 5.0; Muthén & Muthén, 1998–2007) was used to examine directional associations (i.e., regression coefficients) among variables including an interaction term reflecting co-rumination balance (self-focused x other-focused co-rumination). Due to some incomplete data (approximately 3% of participants for some measures), all analyses were conducted with the Full Information Maximum Likelihood estimation (see Muthén & Muthén, 1998-2007) enabling inclusion of all 601 participants by model-based data imputation. Preliminary findings suggested very little empirical (i.e., EFA) or functional (e.g., correlations) distinction between self- and other-focused co-rumination. On the other hand, significant mean level differences were found in all variables according to participants' responses to the single-item direct measure of co-rumination balance. Because the interaction of self- and other-focused co-rumination (average response to Co-rumination Questionnaire items separated by self and other) could yield unique results, they were included in the path analysis as separate correlated variables.

A series of examinations were conducted to specify the direct and indirect relationships among individual characteristics (reassurance seeking, negative problem orientation, social perspective taking, perfectionism, and rumination), co-rumination (self-focused, other-focused, and self x other), and adjustment (friendship quality, anxiety, depression, and social anxiety) among men and women. First, self- and other-focused co-rumination were regressed on individual characteristics. Next, adjustment variables were regressed on self- and other-focused co-rumination, as well as their interaction. Non-significant paths were removed from the predicted model at both of these steps. Regression coefficients are estimations of unique effects as variables at each level were allowed to correlate (e.g., reassurance seeking and rumination),

thereby controlling for shared variance. Next, path coefficients were estimated separately for each gender and, if significantly different, both were be incorporated into the model (multiple group comparisons). Lastly, estimations of both direct and indirect (through co-rumination) effects from individual characteristics to internalizing symptoms and friendship quality were included if significant (see Muthén & Muthén, 1998 - 2007). The final path model (see Figure 2) fit the data well,  $\chi^2(21, N = 601) = 30.61$ ,  $CFI = 1.00$ ,  $RMSEA = .04$ , but did not include several proposed variables (see Figure 1) and provided mixed support for predictions.

#### **Individual Characteristics Related to Self- and Other-focused Co-rumination.**

Rumination, reassurance seeking, and social perspective taking accounted for 17% of variance in self-focused co-rumination, and 17% of variance in other-focused co-rumination. As predicted (Hypothesis 4a), perspective taking was directly related to other-focused co-rumination, but not significantly related to self-focused co-rumination. Although it was thought that rumination (Hypothesis 4b) and reassurance seeking (Hypothesis 4c) would only relate to self-focused co-rumination, they were directly related to *both* self- and other-focused co-rumination. Contrary to expectations, a negative problem orientation (Hypothesis 4d) and perfectionism (Hypothesis 4e) were not significantly related to co-rumination once rumination, reassurance seeking, and perspective taking were considered. Specifically, in the model including all individual characteristics, unique effects or directional paths from negative problem orientation and perfectionism were not significant, and these variables were removed from the model.

**Differentiation and Balance of Self- and Other-focused Co-rumination.** In addition to estimating directional paths from self- and other-focused co-rumination to adjustment, an interaction term (self-focused co-rumination x other-focused co-rumination) was included in the model. Not surprisingly given the weaker correlations, but contrary to initial predictions

(Hypotheses 3c and 3d), co-rumination was *not* significantly related to depression or social anxiety, which were then removed from the final model. On the other hand, self- and other-focused co-rumination related differently to anxiety and friendship quality. It was predicted that an imbalance in the direction of other-focused co-rumination would relate to lower perceived friendship quality (Hypothesis 3b). This prediction was not fully supported as the interaction term was not related to friendship quality. Only self-focused co-rumination had a significant direct effect on friendship quality. One of the predictions (Hypothesis 8) about co-rumination imbalance was supported. Specifically, there was a significant directional path from the interaction term (self x other) to anxiety.

To understand the nature of the interaction effect on anxiety, follow up regression analyses were conducted. Separate regression estimates were conducted for the relationship of self-focused co-rumination on anxiety in the context of low, moderate, and high co-rumination (see Figure 3). Self-focused co-rumination significantly predicted anxiety in the context of low other-focused co-rumination ( $F = 6.65, p < .05$ ), but not in the context of moderate ( $F = 1.00, NS$ ) or high ( $F = 1.58, NS$ ) other-focused co-rumination. Moreover, 95% confidence intervals indicated that the regression estimate of self-focused co-rumination on anxiety in the context of low other-focused co-rumination ( $\beta = .18 [.03 - .24]$ ) was significantly different from the estimate in the context of high other-focused co-rumination ( $\beta = -.09 [-.14 - .03]$ ).

**Direct and Indirect Effects on Anxiety and Friendship Quality.** Direct paths from individual characteristics to adjustment were included in the final model when significant. Specifically, rumination and reassurance seeking were directly related to anxiety, and social perspective taking was directly related to friendship quality. To test whether co-rumination would mediate individual characteristics and adjustment outcomes (Hypothesis 4f), indirect

effects from individual characteristics to adjustment through co-rumination were estimated using bootstrap analysis (5000 iterations). Both reassurance seeking ( $\beta = .05, p < .01$ ) and rumination ( $\beta = .03, p < .05$ ) were positively associated with friendship quality via self-focused co-rumination (mediating effects). Thus, reassurance seeking and rumination did not demonstrate direct effects on friendship quality, but did have indirect impact through self-focused co-rumination.

**Gender Differences in Path Estimates.** To explore gender differences, the model was run as a multi-group model by gender, and paths were allowed to vary according to gender when significantly different. Only one significant gender difference emerged in the path between reassurance seeking and anxiety ( $\Delta\chi^2_{(1, N=601)} = 4.05, p < .05$ ). Specifically, the positive relationship between reassurance seeking and anxiety was significantly stronger for men than women (see Figure 2). Thus, all other path estimates in the model were constrained to be equal for men and women.

Table 1

*Means, Standard Deviations, and Gender Differences in Co-rumination, Adjustment, and Individual Characteristics.*

Variable <sup>a</sup>	Gender			t
	Overall (N =578-601)	Male (N=120-127)	Female (N=458-474)	
<b>Co-rumination</b>				
Self-focused (1.00 - 5.00)	3.00 (.92)	2.69 (.92)	3.08 (.91)	-4.23***
Other-focused (1.00 - 5.00)	3.22 (.95)	2.96 (.97)	3.29 (.93)	-3.56***
Combined (1.00 - 5.00)	3.11 (.89)	2.83 (.92)	3.18 (.87)	-4.08***
<b>Adjustment</b>				
Friendship Quality (1.00 - 4.00)	3.45 (.43)	3.27 (.47)	3.50 (.40)	-5.17***
Anxiety (0.00 - 3.00)	.40 (.43)	.40 (.46)	.40 (.42)	.27
Depression (0.00 - 3.00)	.51 (.61)	.55 (.68)	.51 (.60)	.66
Social Anxiety (1.00 - 5.00)	2.29 (.74)	2.24 (.73)	2.30 (.74)	-.78
<b>Individual Characteristics</b>				
Reassurance Seeking (1.00 - 7.00)	3.21 (1.38)	2.69 (1.35)	3.35 (1.35)	-4.85***
Negative Problem Orientation (1.00 - 5.00)	2.13 (.81)	1.94 (.81)	2.18 (.81)	-2.97**
Social Perspective Taking (1.00 - 5.00)	3.68 (.70)	3.70 (.70)	3.68 (.70)	.36
Perfectionism (1.00 - 5.00)	2.60 (.83)	2.51 (.87)	2.63 (.81)	-1.33
Rumination (1.00 - 4.00)	2.08 (.68)	1.99 (.67)	2.11 (.68)	-1.66

*Note.* Values presented in cells are Mean (Standard Deviation).

<sup>a</sup> Values in parentheses are the range of response options

\*p < .05. \*\*p < .01. \*\*\* p < .00



Table 2

*Percentage of Participants Reporting Various Degrees of Anxious and Depressed Symptoms*

	Anxiety Severity					<b>Total</b>
	Normal	Mild	Moderate	Severe	Extremely Severe	
Normal	62%	5%	4%	1%	0%	<b>71%</b>
Mild	3%	1%	3%	0%	1%	<b>9%</b>
Moderate	3%	1%	4%	2%	1%	<b>11%</b>
Severe	1%	0%	1%	1%	1%	<b>5%</b>
Extremely Severe	1%	1%	1%	1%	1%	<b>5%</b>
<b>Total</b>	<b>70%</b>	<b>8%</b>	<b>13%</b>	<b>5%</b>	<b>4%</b>	<b>100%</b>

*Note.* Values presented are percentages calculated by dividing cell size by total participants (N = 579). Total row and column are percentages are summed percentages across row or column, respectively.

Table 3

*Correlation Coefficients for Self, Other, and Combined Co-rumination with Individual Characteristics*

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Co-rumination</b>												
1. Self-focused	1.00											
2. Other-focused	.82***	1.00										
3. Combined	.95***	.96***	1.00									
<b>Adjustment</b>												
4. Friendship Quality	.45***	.33***	.41***	1.00								
5. Anxiety	.14***	.15***	.15***	-.03	1.00							
6. Depression	.09*	.10*	.10*	-.03	.66***	1.00						
7. Social Anxiety	.09*	.10*	.10*	-.10*	.50***	.47***	1.00					
<b>Individual Characteristics</b>												
8. Reassurance Seeking	.41***	.39***	.42***	.18***	.37***	.31***	.35***	1.00				
9. Negative Problem Orientation	.22***	.24***	.24***	.01	.50***	.52***	.56***	.57***	1.00			
10. Social Perspective Taking	.01	.08	.05	.13**	-.06	-.04	-.10*	-.05	-.13**	1.00		
11. Perfectionism	.15***	.16***	.16***	.00	.44***	.45***	.49***	.41***	.61***	-.14**	1.00	
12. Rumination	.25***	.28***	.27***	.05	.58***	.70***	.55***	.41***	.60***	-.03	.54***	1.00

*Note.* r values presented are Pearson Correlations and significance determined based on two-tail tests. N = 576 – 601.

\*p < .05. \*\*p < .01. \*\*\* p < .001

Table 4

*Co-rumination Items' Structural Factor Loadings in Exploratory Factor Analysis*

Item		Factor	
		1	2
We talk about problems that I am having almost every time we see each other.	Self 1	.46	<b>.81</b>
When we see each other, if I have a problem, we will talk about my problem even if we had planned to do something else together.	Self 2	.52	<b>.82</b>
When I have a problem, [name of best friend] always tries to get me to tell every detail about what happened.	Self 3	<b>.60</b>	.58
When we talk about a problem that I have, we'll talk about every part of my problem over and over.	Self 4	<b>.73</b>	.66
When we talk about a problem that I have, we talk about all of the reasons why my problem might have happened.	Self 5	<b>.79</b>	.51
When we talk about a problem I have, we try to figure out every one of the bad things that might happen because of my problem.	Self 6	<b>.82</b>	.43
When we talk about a problem I have, we spend a lot of time trying to figure out parts of my problem that we can't understand.	Self 7	<b>.82</b>	.45
When we talk about a problem that I have, we talk a lot about how bad I feel.	Self 8	<b>.74</b>	.61
We talk about problems [name of best friend] is having almost every time we see each other.	Other 9	.55	<b>.83</b>
When we see each other, if [name of best friend] has a problem, we will talk about the problem even if we had planned to do something else together.	Other 10	.58	<b>.80</b>
When [name of best friend] has a problem, I always try really hard to keep [name of best friend] talking about it.	Other 11	<b>.63</b>	.56
When we talk about a problem that [name of best friend] has, we'll talk about every part of the problem over and over.	Other 12	<b>.79</b>	.62
When we talk about a problem that [name of best friend] has, we talk about all of the reasons why the problem might have happened.	Other 13	<b>.83</b>	.54
When we talk about a problem that [name of best friend] has, we try to figure out every one of the bad things that might happen because of the problem.	Other 14	<b>.85</b>	.46
When we talk about a problem that [name of best friend] has, we spend a lot of time trying to figure out parts of the problem that we can't understand.	Other 15	<b>.83</b>	.48
When we talk about a problem that [name of best friend] has, we talk a lot about how bad the person with the problem feels.	Other 16	<b>.73</b>	.59

*Note.* Extraction method was Principal Component Analysis with an Oblimin rotation. N = 601

Presented values are factor loadings (primary loading bolded) from the resulting structure matrix.

Table 5

*Differences in Individual Characteristics and Adjustment According to Self-focused, Other-focused, and Balanced Co-rumination*

Variable	Co-rumination Balance			F	d	Effect size
	Other-focused (N =108, 18%)	Balanced (N=433, 73%)	Self-focused (N=54, 9%)			
<b>Adjustment</b>						
Friendship Quality	3.32 <sup>a</sup> (.46)	3.49 <sup>b</sup> (.40)	3.45 (.50)	6.82**	.40	small
Anxiety	.38 <sup>a</sup> (.38)	.39 <sup>a</sup> (.43)	.55 <sup>b</sup> (.46)	3.59*	.42	small
Depression	.46 <sup>a</sup> (.59)	.49 <sup>a</sup> (.61)	.76 <sup>b</sup> (.65)	4.99**	.49	moderate
Social Anxiety	2.25 <sup>a</sup> (.78)	2.27 <sup>a</sup> (.72)	2.52 <sup>b</sup> (.77)	3.01*	.35	small
<b>Individual Characteristics</b>						
Reassurance Seeking	3.22 <sup>a</sup> (1.49)	3.34 <sup>a</sup> (1.41)	4.20 <sup>b</sup> (1.55)	9.38***	.65	moderate
Negative Problem Orientation	2.12 <sup>a</sup> (.88)	2.10 <sup>a</sup> (.78)	2.50 <sup>b</sup> (.88)	5.96**	.43	small
Social Perspective Taking	3.78 <sup>b</sup> (.69)	3.69 <sup>b</sup> (.69)	3.43 <sup>a</sup> (.76)	4.59*	.49	moderate
Perfectionism	2.54 <sup>a</sup> (.90)	2.57 <sup>a</sup> (.79)	2.97 <sup>b</sup> (.91)	6.07**	.48	moderate
Rumination	2.04 <sup>a</sup> (.74)	2.04 <sup>a</sup> (.65)	2.42 <sup>b</sup> (.66)	7.82***	.54	moderate

*Note.* Values presented in cells are Mean (Standard Deviation). Different subscripts in the same row reflect significant differences ( $p < .05$ ) determined by follow-up Tukey post hoc tests.  $N = 595$ .

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

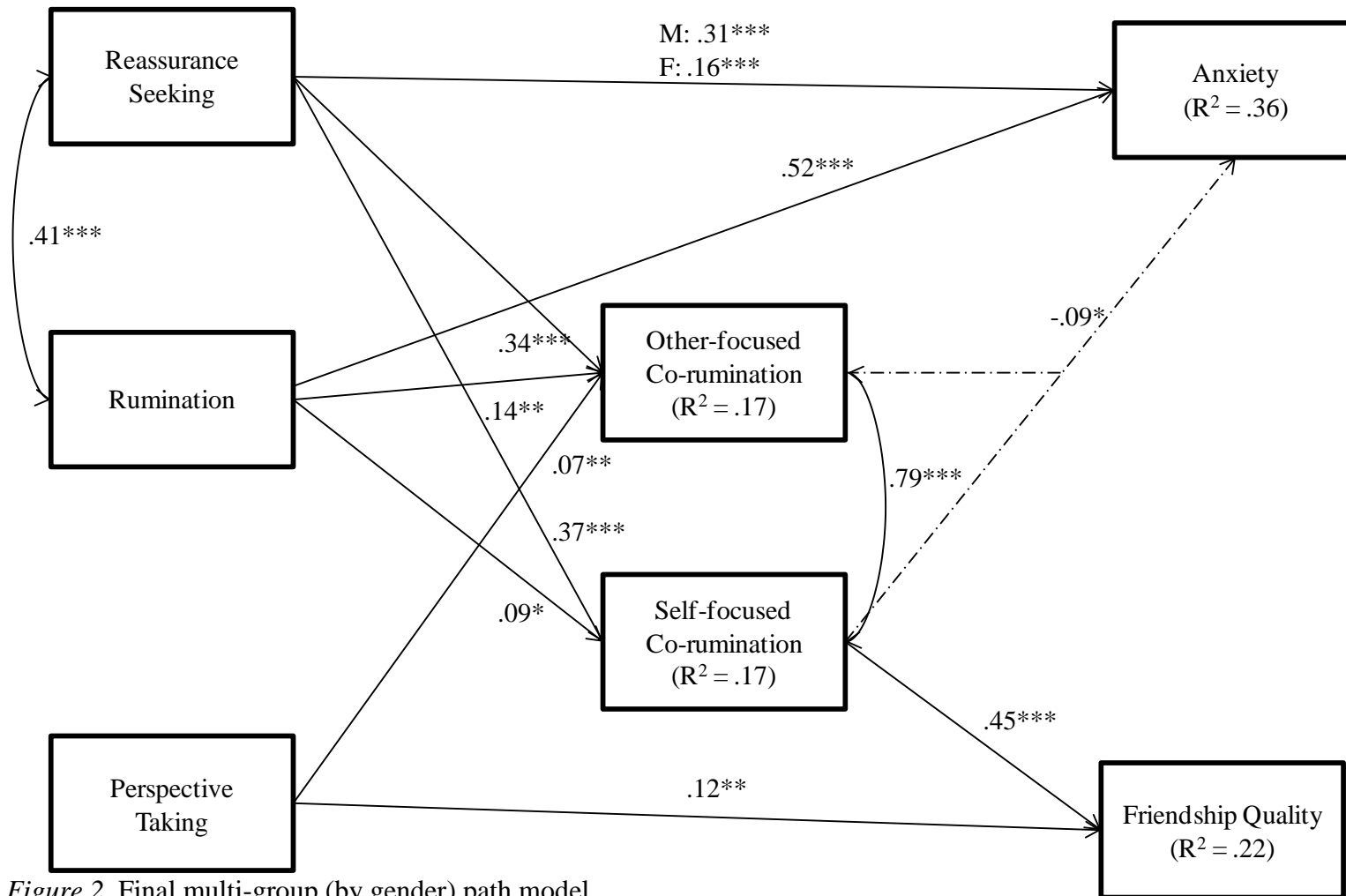
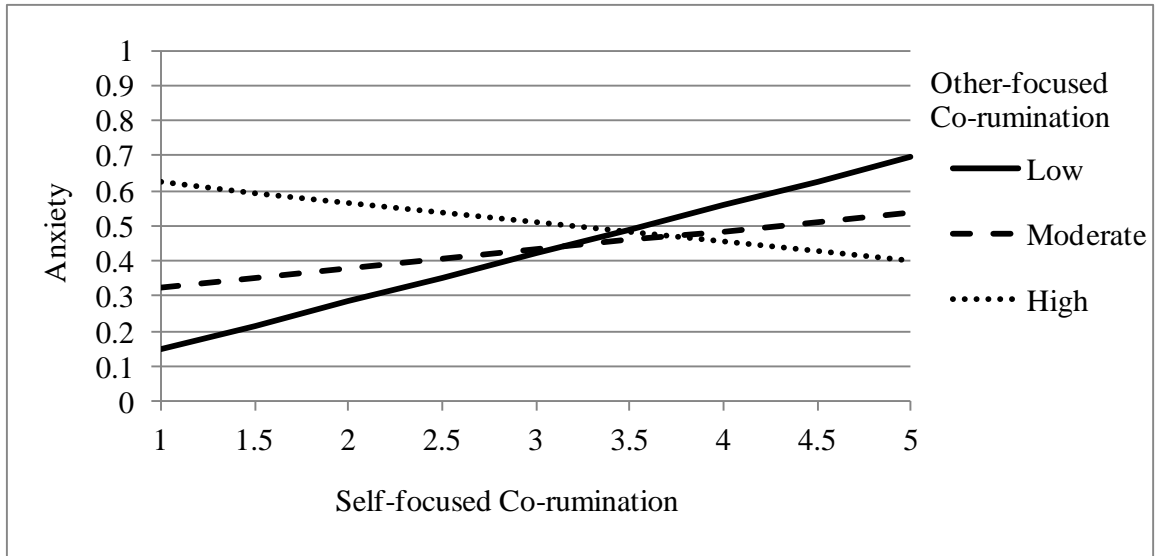


Figure 2. Final multi-group (by gender) path model.

\*p < .05. \*\*p < .01. \*\*\* p < .001



*Figure 3.* Illustration of the interaction effect of self- and other-focused co-rumination for anxiety. Participants were divided into three equally sized groups of low, moderate, or high other-focused co-rumination.

## **Discussion**

Individuals suffering from internalizing symptoms may seek social support in a manner that can paradoxically create more distress (Rose, 2002). Co-rumination refers to a dyadic social coping process characterized by repeated vocalization of depressive and anxious rumination (Rose, 2002). Compelling evidence has implicated the unique role of co-rumination in a cyclical relationship with both anxiety and depression in adolescent samples, but unanswered questions remained. The intention of the current study was to advance knowledge regarding the clinical nature of co-rumination in adult friendships. As one of only a few examinations of co-rumination and internalizing symptoms in adult friendships (Bouchard & Shih, 2013; Calmes & Roberts, 2008; White & Shih, 2012), the current study provided support for this model beyond adolescence with the following findings.

Co-rumination in adult (undergraduate) friendships was associated with both increased friendship quality and internalizing symptoms, specifically anxiety. Further, positive friendship effects may stem directly from re-hashing one's own problems (self-focused co-rumination), and anxiety is associated with excessive discussion of one's own problems without similar processing of a best friend's problems (imbalance in the direction of self-focused co-rumination). Co-rumination was more strongly associated with friendship quality than anxiety. Exploration of individual traits associated with co-rumination suggested that it is associated with wanting social assurance (excessive reassurance seeking) and sharing consuming internal dialogue (rumination). Individuals particularly adept at empathetic understanding (social perspective taking) may be on

the listening end of co-ruminative friendships (other-focused co-rumination). Self- and other-focused co-rumination were highly correlated and not distinct in factor analysis. This suggested most individuals perceive equal re-hashing of their own problems and those of their best friend. If one friend co-ruminates, most likely so does the other. However, both measures of balance (a single direct item and the interaction of 8 self- and 8 other-focused co-rumination items) yielded interesting findings. Specifically, mean levels of all study variables differed according to the single-item direct measure of co-rumination balance, and the interaction of the self- and other-focused co-rumination (imbalance in the direction of self-focused co-rumination) was associated with anxiety. Thus, the current study produced inconclusive evidence regarding the validity and value of distinctions between self- and other-focused co-rumination. These findings will be elaborated in three sections: (1) relationships between co-rumination and internalizing symptoms, (2) individual characteristics (rumination, social perspective taking, excessive reassurance seeking, perfectionism, negative problem orientation) associated with co-rumination, and (3) differentiation of self- from other-focused co-rumination and the relationship of their balance on adjustment.

### **Co-rumination and Internalizing Symptoms**

It has been theorized by others that co-rumination relates to depressive symptoms because of the focus on negative feelings and to anxiety due to the focus on negative consequences (Rose, 2002). Empirically, co-rumination has been associated with greater *combined* internalizing symptoms (e.g., Tompkins et al., 2011), as well as both anxiety and depression specifically. The handful of studies measuring symptoms of depression and anxiety separately find positive associations between co-rumination and both in *separate* analyses (e.g., Calmes & Roberts, 2008; Rose, 2007; Schwartz-Mette & Rose, 2012). Only two studies have



specifically considered *social* anxiety. Co-rumination has been associated with lower levels of social anxiety in one study (Starr & Davila, 2009) and higher levels in another (Jose et al., 2012).

In the present study, co-rumination was directly correlated with symptoms of depression, overall anxiety, and social anxiety. However, associations between co-rumination and anxiety remained significant when other internalizing symptoms were controlled, but not vice versa. These results suggest that co-rumination is more strongly associated with anxiety than depression. It should be noted that due to great co-occurrence among internalizing symptoms (Kessler, Chiu et al., 2005), determining whether co-rumination is related to anxiety, depression, or both may be of little clinical significance as individuals regularly experience both anxiety and depression, and often at the same time. However, our results contribute to theoretical understanding of co-rumination. Aligned with a previous finding that negative repetitive thought predicts anxiety but not depression (Calmes & Roberts, 2007), the present study suggests that co-rumination is best conceptualized as an anxious process. Thus, co-rumination is likely another variant of avoidant behavior typical of anxiety disorders, rather than an active attempt to address problems. Perhaps "co-worry" might be a better descriptor of excessive re-hashing of problems with a friend.

**Is Co-rumination Not Related to Depression?** These novel findings appear contradictory to existing evidence that supports a relationship between co-rumination and depression. For example, co-rumination has predicted clinical onset of depression in adolescence (Stone et al., 2011). However, other studies have found minimal, qualified, or no relationship between co-rumination and depressive symptoms (Dam, Roelofs, & Muris, 2013; Bouchard & Shih, 2013; Rudiger & Winstead, 2013). Two interpretative possibilities come to mind: (1) co-rumination is associated with depression, but small effects accumulate over time or only under

certain circumstances, or (2) the demonstrated relationship between co-rumination and depression is a byproduct of co-morbidity of anxiety and depression.

The first possibility is that co-rumination may be related to depressive symptoms, just not as strongly as it relates to anxious symptoms. For example, co-rumination may have a small incremental impact on the development of depression over time. To this point, co-rumination has been related to *daily* depressed mood (mood rating via daily diary) but not self-report of overall depressive symptoms (Bouchard & Shih, 2013; White & Shih, 2012). Other findings suggest that co-rumination with a best friend may only be related to depression under specific conditions, such as when communication with other peers is limited (Dam et al., 2013) or only when problems discussed are social and controllable (Nicolai et al., 2013).

Another possibility is that connections between co-rumination and depressive symptoms may be a result of co-morbid anxiety. Our measurement choice (DASS) was selected in part for its good discrimination of anxiety and depression, whereas prior co-rumination studies employed different measures of internalizing symptoms, often the Beck Measures. There is some suggestion that the DASS, compared to the Beck Depression Inventory (BDI: Beck, Steer, & Brown, 1996) and Beck Anxiety Inventory (BAI: Beck, Epstein, Brown, & Steer, 1988), might better differentiate symptoms of anxiety and depression. Specifically, factor analysis (Lovibond & Lovibond, 1995) suggests some anxiety is included in Beck's depression scale (i.e., BAI items also load on BDI). Additionally, the BDI includes somatic symptoms (i.e., sexual interest, appetite/weight, and sleep) that are poor differentiators of depression and anxiety and so are excluded from the DASS (see Lovibond & Lovibond, 1995). Thus, the current assessment approach may have obtained more "pure" measures of anxiety and depression compared to previous studies.

## **Clinical Characteristics of Co-rumination**

People interact with their environments in a manner that tends to strengthen existing personal traits in a process called dynamic interactionsism (Luyten et al., 2006). Once a co-ruminating friendship is formed, it may be particularly difficult to disengage from it due to the reinforcing effects of relationship enhancement. As such, it is important to identify individual characteristics that predispose someone to this type of interaction. Results from the path model suggested reassurance seeking, rumination, and social perspective taking are personal traits associated with co-rumination, while a negative problem orientation and perfectionism are not related to co-rumination when overlap with other predictors is considered. Each of the individual characteristics as it relates to co-rumination is discussed, followed by interpretation of direct and indirect effects on anxiety and friendship quality.

**Rumination.** While rumination and co-rumination share some common variance, they are separate constructs. Previous analysis found factorial differentiation between co-rumination and various types of negative repetitive thought, including anxious worry and depressed rumination (Ciesla et al., 2011). Confirming meaningful distinction of rumination and co-rumination, the moderate correlation ( $r = .27$ ) obtained here was quite similar to previous findings ( $r = .31$ , Calmes & Roberts, 2008). Rumination can be difficult to ignore (e.g., Woodruff-Borden et al., 2001). It precludes instrumental or helpful behavior (e.g., Davis & Nolen-Hoeksema, 2000; Lyubomirsky et al., 1999; Lyubomirsky et al., 2006; Ward et al., 2003) and leads to maladaptive problem discussion. For example, induced rumination (asking participants to focus their thoughts on emotions, symptoms, and the self) results in spontaneous discussion of problems (Lyubomirsky et al., 1999). A significant association between rumination and co-rumination in the path model suggests that one may excessively discuss problems with

their friend somewhat involuntarily because they can't ignore their engrossing negative internal thoughts.

**Excessive Reassurance Seeking.** This is the first known study to compare co-rumination and excessive reassurance seeking, which appear to be similar manners of social coping ( $r = .42$ ). Future studies might consider whether co-rumination and excessive reassurance seeking are somewhat interchangeable maladaptive coping mechanisms or different in important ways. One important difference is that unlike co-rumination, excessive reassurance seeking is not conceptualized as reciprocal process. Rather, reassurance seeking is thought to be an individual trait often perceived by others as irritating (Starr & Davila, 2008b). In the existing literature, co-rumination has not been conceived as an irritating interpersonal interactive style, but could it be? The path model suggested the friendship intimacy associated with co-rumination comes specifically from talking about one's own problems, not listening to others' problems. Both friends' perceptions of co-rumination and tracking trajectories and characteristics of co-ruminating friendships over time could determine how co-rumination is perceived by others and whether it might ultimately be detrimental to relationships.

**Social Perspective Taking.** In the path model, social perspective-taking was only related to listening to other-focused co-rumination. Meaning, being a skilled empathic listener is related to having a best a friend who excessively discusses his or her problems. Others may seek out perspective-taking individuals for understanding and because they are altruistic (Underwood & Moore, 1982), they may have difficulty extricating themselves even if conversation is particularly negative and excessive. Moreover, positive reinforcement received when their personal strength is put to use probably results in pride and a boost to self-esteem. Thus, sometimes participation in co-rumination may be less related to personal problems and more

related to putting one's relational ability to use. The association between social perspective taking and other-focused co-rumination was fairly weak, but aligned with the only other known comparison (Smith & Rose, 2011).

**Perfectionism and Negative Problem Orientation.** Perfectionism and a negative problem orientation (i.e., negative attitude towards, and perceived inability to, problem-solve) were correlated with co-rumination, but contrary to expectations, neither remained significantly linked to co-rumination when other traits were simultaneously included in the model. Without unique predictive ability, the clinical and conceptual utility of perfectionism and a negative problem orientation in understanding co-rumination is limited.

**Direct and Indirect Effects.** Predictions that co-rumination would mediate the relationship between individual characteristics and adjustment were examined by considering indirect effects in the path model. Both rumination and reassurance seeking had direct effects on anxiety and indirect mediating effects on friendship quality via self-focused co-rumination. Co-rumination was not found to be a significant mediator of individual characteristics and anxiety. Rather, co-rumination, rumination, and reassurance seeking all demonstrated direct effects on anxiety. Rumination and reassurance seeking are considered maladaptive and links to anxiety were expected (for reviews see Evraire & Dozois, 2011; Nolen-Hoeksema et al., 2008). In contrast, rumination and excessive reassurance seeking had only indirect effects on friendship quality. Because rumination and excessive reassurance seeking are tied to co-rumination, they are indirectly associated with a positive outcome, namely increased friendship quality.

### **Self- and Other-focus Disentangled and Co-rumination Balance**

Consistent with studies that differentiate self- and other-focused co-rumination (Calmes & Roberts, 2008; Waller & Rose, 2013), results suggest that if you co-ruminate about your

problems, you are extremely likely to also talk about your best friend's problems in a similar manner. The large correlation between self- and other-focused co-rumination, a similar pattern (and magnitude) of correlations between co-rumination and other variables regardless of problem focus (self vs. other), and lack of factorial distinction between self- and other-focused co-rumination all suggested very little conceptual or functional distinction between self- and other-focused co-rumination. However, two findings suggested otherwise. First, there were group-level differences in internalizing symptoms, friendship quality, and all individual characteristics, according to the single direct item of co-rumination balance. Second, path modeling suggested self-focused co-rumination is a key driver in friendship quality, and interacts with other-focused co-rumination in its relationship with anxiety. Specifically and as predicted, anxiety is associated with imbalanced co-rumination in the direction of greater self-, compared to other-, focused co-rumination. These findings are discussed in detail below.

**Factor Structure of Co-rumination.** Historically, co-rumination was demonstrated to be a single factor construct (Rose, 2002), but factor analysis has never before been conducted based on self- and other-focused co-rumination items. Self- and other-focused items were expected to load on separate self- and other-focused co-rumination factors, but instead each self-focused item demonstrated analogous factor loadings to its corresponding other-focused item. Thus, the current factor analysis did not support differentiating self- and other-focused co-rumination. However, the current study also did not strongly support the originally demonstrated single factor structure (Rose, 2002). In the current study, a strong primary factor (55% of variance) was supplemented by a second auxiliary factor (8% of variance) that seemed to measure the frequency and interference of co-rumination. The present study aligns with a recent exploratory factor analysis (Dam et al., 2013) also suggestive of an alternative underlying co-rumination

structure. Specifically, co-rumination was comprised of three factors: frequency (time spent co-ruminating), detailed discussion (dwelling on problem details), and comprehension (considering problem causes and consequences). It seemed that frequent interference may be an important, perhaps pathological, aspect of co-rumination. Perhaps the second smaller factor found in the present study is inconsequential but, it was appropriate to report given new conflicting factorial evidence (Dam et al., 2013).

**Co-rumination Balance.** Aligned with homophily of anxiety (e.g., Schwartz-Mette & Rose, 2012) and reciprocity of relationships (e.g., Väänänen et al., 2008), all evidence (based on one friend's report) suggested that friendships tend to be quite balanced in their problem discussion. For example, self- and other-focused co-rumination were highly correlated and 89% of discrepancy scores indicated less than one point difference in self- and other-focused co-rumination. However, results also suggested that while rare, when friendships are imbalanced in problem discussion, it matters. Mean differences according to the single face-valid item provided preliminary evidence that co-rumination balance may be meaningful, but only some effects emerged in the path model using the interaction term approach to assess co-rumination balance. Thus, evidence from the path model did align with results from the direct item, and provided some support for the uniqueness of self- and other-focused co-rumination, and the importance of their balance. Results based on both measurement approaches and comparison of the two methods follows.

***A Direct Measure of Balance.*** A single direct item was included as one method of exploring co-rumination balance. Predictions about this item were not made as it was initially intended to be a validity check of the more statistically sophisticated approach based on an interaction term included in the path model. Results based on this direct measurement strongly

aligned with predictions regarding co-rumination balance. Specifically, individuals who perceive their friendship as imbalanced towards greater other-focused problem discussion reported greater perspective-taking ability, but lesser friendship quality than those in more balanced or self-focused friendships. Imbalanced friendships perceived to be mostly self-focused in nature were characterized by greater internalizing symptoms, reassurance seeking, rumination, perfectionism, and a more negative problem orientation. These results suggest that individuals in other-focused friendships may be particularly adept at social perspective taking, but this ability may at the same time limit their own experience of friendship quality. Individuals in excessively self-focused friendships are likely quite distressed, ruminative, and their behavior might ultimately lead to hurtful rejection, thereby exacerbating the cycle of internalizing symptom development.

***Modeling Balance of Self- and Other-focused Co-rumination.*** Unique effects on both friendship quality and anxiety emerged when self- and other-focused co-rumination were both included as correlated variables in an inclusive path model. Namely, (1) only self-focused co-rumination was related to friendship quality, and (2) anxiety was related to imbalanced self-focused co-rumination. Thus, the well-documented positive friendship effects of co-rumination are specifically related to talking about one's own problems. The interaction effect between self- and other-focused co-rumination indicated it is the extreme self-focused co-rumination, coupled with little discussion of a best friend's problems, that is associated with anxiety; whereas more balanced problem discussion, even if negative and repetitive, may not have a strong concurrent association with psychopathology. It is likely that asymmetrical relationships contribute to anxiety development by reinforcing dependency, avoidance, and helplessness. As relationships are bi-directional, another interpretation is that anxious individuals monopolize conversation.



**Measurement of Balance.** Several points regarding the two approaches used to measure balance are important. Both approaches assessed *perceived* degree and direction of discrepancy in self- and other-focused problem discussion. The direct question (i.e., whose problems are "typically the focus of problem discussion") forced distinction by omitting an option of absolute balance and did not specify the *manner or type* of discussion. For example, with the direct item it is unknown whether problem discussion is negative, excessive, repetitive, or focused on negative consequences. Further, it does not take into account the amount of problem discussion. It only determines whether problem discussion is imbalanced. The direct query is akin to a pure discrepancy score (average of self items minus average of other items) which assess direction and degree of balance, but not level or severity of co-rumination. For example, two friends can be equally high or equally low in co-rumination. In contrast, the primary measurement approach examined an interaction term (8 self items x 8 other items) derived from ratings of various features of co-rumination using an established measure (Co-rumination Questionnaire: Rose, 2002). There are pros and cons to this approach. For example, participants are less affected by social desirability if underlying constructs are presented more subtly, but distinctions might not be made between similarly worded questions. Attempts were made to call attention to specifics of questions (i.e., inserting and bolding the friend's first name in survey questions, see Appendix B). Perhaps participants understood exactly what was asked, but problem discussion between two best friends is so similar in manner, content, and frequency that only a direct query without an option of total equality elicits consideration and identification of imbalance.

**Implications for Mechanisms of Influence.** Although not specifically examined here, two mechanisms have been proposed for how co-rumination might operate to increase internalizing symptoms, namely empathetic distress and stress generation. This deconstructed

framework of self- and other-focused co-rumination contributes to these two theories because stress generation and empathetic distress implicate different types of problem discussion. Specifically, empathetic distress is hypothesized to stem from learning of a friend's problems (Smith & Rose, 2011), whereas stress generation (interpersonal rejection) is theorized to occur as a result of excessive self-focused discussion (Hankin et al., 2010; see also Bouchard & Shih, 2013; White & Shih, 2012). Results seem consistent with stress generation theory as *self-focused* co-rumination drove the association with anxiety. Only partial support was obtained for a "cost of caring" or empathetic distress model (Smith & Rose, 2011) as social perspective taking was associated with other-focused co-rumination, but re-hashing a friend's problems did not predict anxiety. However, it is still possible that repetitive listening to a friend's negative problem interpretation leads to long-term increases in internalizing symptoms via small incremental accumulation of empathetic distress.

### **Considerations and Limitations**

Self- and other-focused co-rumination were highly correlated, which means friendships are usually perceived to be highly balanced. This makes examination of self- versus other-focused co-rumination with a normative sample very difficult. Future research might need to focus only on friendships characterized by unbalanced problem discussion. One limitation of the current study is that results are based solely on one individual's perception, even as the construct itself is dyadic. It will be critical to replicate findings regarding co-rumination distinction and balance with dyadic data before fully integrating these results into theoretical conceptualization. Objective naturalistic or semi-naturalistic (staged problem discussion) observation of both friends' co-rumination behavior would certainly be interesting if findings regarding differentiated co-rumination are replicated.

The two methods of assessing co-rumination balance, and analyzing its effects, produced similar, but not identical, results. An alternative assessment of co-rumination balance might integrate the response scale from the direct item with each co-rumination question (e.g., "We talk a lot about how bad we feel" with response options from [4] almost always true when we talk about *my* problems to [-4] almost always true when we talk about *my best friend's* problems). In this manner, direction and degree of discrepancy could be obtained, and then averaged, for specific aspects of co-rumination. With the option of balance omitted, this should lead to differentiation. The downside would be only having a measure of co-rumination balance, and not having separate self- and other-focused measures.

Sample characteristics limit the generalizability these findings. College students are certainly not representative of adults in the community (e.g., age, socioeconomic status, stress), and a clinical sample is often preferred when examining psychopathology. This sample was noteworthy in that well-founded gender differences in internalizing symptoms did not emerge (for review see Burstein et al., 2012). Some studies do not find gender differences. For example, in a very large sample of college students, females reported more symptoms of anxiety, but not depression, on the DASS measure employed here (Bayram & Bilgel, 2008). An in-depth discussion of gender differences in internalizing symptoms is beyond the scope of this project, but this unexpected result certainly makes this sample unique.

Lastly, all analyses were non-experimental and cross-sectional, and so should not be interpreted as causal. Directional relationships necessitate longitudinal data, and directional predictions were somewhat arbitrary as actual associations are cyclical. Longitudinal data could reveal incremental accumulation of small effects of co-rumination and tell whether co-ruminating friendships end in rejection or last.

The definitional additions made to the co-rumination questionnaire is a strength worth mention. Specifically, best friendships were limited "same-sex" to "non-romantic," and "talk" was explicitly expanded to include various modern methods of communication. While functional impact is unknown, these changes make good sense, especially considering how participants reported they typically communicate with a best friend.

### **Implications and Future Directions**

Several research directions are suggested by the present study. First, co-rumination might be mostly a result of anxious feelings. This understanding can guide co-rumination and anxiety researchers in developing research questions and conceptual models. Co-rumination may seem like an active attempt to address one's problems, but it may actually operate like worry and other forms of anxious avoidance to perpetuate anxiety (Behar et al., 2009). In essence, regular co-rumination may prevent a corrective experience when problems are resolved without over-analysis. Without such an experience, problems will likely continue to be viewed as insurmountable and anxiety will be maintained. Avoidance has not yet been proposed as a mechanism of co-rumination and could be studied alongside empathetic distress and stress generation theories. Second, co-rumination reciprocity warrants further exploration, especially with dyadic data, as 27% of participants recognize their best friendship as more than slightly imbalanced, and these friendships reported different levels of friendship quality, internalizing symptoms, and each individual characteristic. In addition to measuring co-rumination as a mutual process occurring inside a specific relationship, co-rumination could also be assessed as an individual's tendency to relate across relationships. With a more open-ended approach, White and Shih (2012) asked "did you confide in a close confidant today?" and then allowed participants to report of co-ruminative characteristics of that interaction. Of note, only 58% of

"close confidants" were best friends. Third, research regarding mechanisms of influence should focus on self-focused problem discussion that seems implicated in both the benefit (friendship quality) and harm (anxiety) of co-rumination. Perhaps co-rumination as typically measured by self-report on the Co-rumination Questionnaire (Rose, 2002) is actually tapping self-focused co-rumination, which is not easily distinguished from perceptions of other-focused co-rumination, rather than a joint dyadic process. Dyadic and observational data could answer these questions. Fourth, situational aspects of co-rumination should be considered. For example, co-rumination likely occurs in groups as well as dyads, such as among classmates or work groups (Haggard et al., 2011), and certain situational characteristics (e.g., stress, work culture, group unity) likely contribute to whether problems are approached in a co-ruminative manner. Fifth, results regarding the characteristics associated with co-rumination were not strong. Perhaps an exploratory approach to co-rumination study would prove fruitful. Cluster analysis could reveal meaningful taxonomies, types or groupings, of co-ruminative friendships. Perhaps co-rumination is associated with increases in quality in some friendships and decreases in closeness in others. If so, cluster analysis would allow for examination of characteristics (e.g., reassurance seeking, degree of anxiety of both friends) associated with various groups (e.g., based on friendship quality) of co-ruminative friendships.

## **Conclusion**

Prevailing thought presumes both dyad members jointly engage in co-rumination, each incurring positive and negative effects. The current study supports a nuanced and slightly different conceptualization. Co-rumination emerged as a manner of social coping with primarily anxiety. Balanced levels of co-rumination were most typical based on self-report of one individual, and self- and other-focused co-rumination were generally not meaningfully distinct.

However, unique and interactive effects emerged in some analyses. Only excessive discussion of one's own problems was related to higher friendship quality, and anxiety was associated with high self-focused co-rumination in the context of low other-focused co-rumination. Social perspective taking ability might lead to a friendship characterized by mostly discussion of a friend's problems. Otherwise, co-ruminating seems to stem from wanting assurance from others and sharing engrossing internal rumination, and co-rumination is reinforced by positive feelings associated specifically with re-hashing one's own problems.

## References

- Alden, L. E., & Bieling, P. (1998). Interpersonal consequences of the pursuit of safety. *Behaviour Research and Therapy*, *36*, 53-64. doi:10.1016/S0005-7967(97)00072-7
- Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, *43*, 667-672. doi:10.1007/s00127-008-0345-x
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*, 893-897. doi:10.1037/0022-006X.56.6.893
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventory I and II in psychiatric outpatients. *Journal of Personality Assessment*, *67*, 588-597. doi:10.1207/s15327752jpa6703\_13
- Beck, A.T., Steer, R.A., & Brown, G.K. (1996). *BDI-II Manual*. San Antonio, TX: The Psychological Corporation.
- Beck, R., Robbins, M., Taylor, C., & Baker, L. (2001). An examination of sociotrophy and excessive reassurance seeking in the prediction of depression. *Journal of Psychopathology and Behavioral Assessment*, *23*, 101-105.  
doi:10.1023/A:1010963624940

- Behar, E., DiMarco, I., Hekler, E. B., Mohlman, J., & Staples, A. M. (2009). Current theoretical models of generalized anxiety disorder (GAD): Conceptual review and treatment implications. *Journal of Anxiety Disorders, 23*, 1011-1023.  
doi:10.1016/j.janxdis.2009.07.006
- Benenson, J. F., Apostoleris, N. H., & Parnass, J. (1997). Age and sex differences in dyadic and group interaction. *Developmental Psychology, 33*, 538-543. doi:10.1037/0012-1649.33.3.538
- Besser, A., Flett, G. L., & Hewitt, P. L. (2004). Perfectionism, cognition, and affect in response to performance failure vs success. *Journal of Rational-Emotive & Cognitive Behavior Therapy, 22*, 301-328. doi:10.1023/B:JORE.0000047313.35872.5c
- Birgenheir, D. G., Pepper, C. M., & Johns, M. (2010). Excessive reassurance seeking as a mediator of sociotropy and negative interpersonal life events. *Cognitive Therapy and Research, 34*, 188-195. doi:10.1007/s10608-009-9242-1
- Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: Experimental evidence. *Journal of Personality and Social Psychology, 92*, 458-475.  
doi:10.1037/0022-3514.92.3.458
- Bouchard, L. C., & Shih, J. H. (2013). Gender differences in stress generation: Examination of interpersonal predictors. *Journal of Social and Clinical Psychology, 32*, 424-445.
- Brendgen, M., Vitaro, F., Turgeon, L., & Poulin, F. (2002). Assessing aggressive and depressed children's social relations with classmates and friends: A matter of perspective. *Journal of Abnormal Child Psychology, 30*, 609-624. doi:10.1023/A:1020863730902



- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research And Therapy*, *35*, 79-89. doi:10.1016/S0005-7967(96)00068-X
- Bukowski, W. M., Adams, R. E., & Santo, J. B. (2006). Recent advances in the study of development, social and personal experience, and psychopathology. *International Journal of Behavioral Development*, *30*, 26-30. doi:10.1177/0165025406059970
- Burstein, M., Georgiades, K., Lamers, F., Swanson, S. A., Cui, L., He, J., & ... Merikangas, K. R. (2012). Empirically derived subtypes of lifetime anxiety disorders: Developmental and clinical correlates in U.S. Adolescents. *Journal of Consulting and Clinical Psychology*, *80*, 102-115. doi:10.1037/a0026069
- Buunk, B. P., & Hoorens, V. (1992). Social support and stress: The role of social comparison and social exchange processes. *British Journal of Clinical Psychology*, *31*, 445-457.
- Byrd-Craven, J., Geary, D. C., Rose, A. J., & Ponzi, D. (2008). Co-ruminating increases stress hormone levels in women. *Hormones and Behavior*, *53*, 489-492.  
doi:10.1016/j.yhbeh.2007.12.002
- Byrd-Craven, J., Granger, D. A., & Auer, B. J. (2011). Stress reactivity to co-rumination in young women's friendships: Cortisol, alpha-amylase, and negative affect focus. *Journal of Social and Personal Relationships*, *28*, 469-487. doi:10.1177/0265407510382319
- Calmes, C. A., & Roberts, J. E. (2007). Repetitive thought and emotional distress: Rumination and worry as prospective predictors of depressive and anxious symptomatology. *Cognitive Therapy and Research*, *31*, 343-356. doi:10.1007/s10608-006-9026-9

- Calmes, C. A., & Roberts, J. E. (2008). Rumination in interpersonal relationships: Does Co-rumination explain gender differences in emotional distress and relationship satisfaction among college students? *Cognitive Therapy and Research*, *32*, 577-590.  
doi:10.1007/s10608-008-9200-3
- Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of Personality and Social Psychology*, *66*, 184-195.  
doi:10.1037/0022-3514.66.1.184
- Ciesla, J. A., Dickson, K. S., Anderson, N. L., & Neal, D. J. (2011). Negative repetitive thought and college drinking: Angry rumination, depressive rumination, co-rumination, and worry. *Cognitive Therapy and Research*, *35*, 142-150. doi:10.1007/s10608-011-9355-1
- Ciesla, J. A., & Roberts, J. E. (2007). Rumination, negative cognition, and their interactive effects on depressed mood. *Emotion*, *7*, 555-565. doi:10.1037/1528-3542.7.3.555
- Cillessen, A. N., Jiang, X., West, T. V., & Laszkowski, D. K. (2005). Predictors of dyadic friendship quality in adolescence. *International Journal of Behavioral Development*, *29*, 165-172. doi:10.1080/01650250444000360
- Cougle, J. R., Fitch, K. E., Fincham, F. D., Riccardi, C. J., Keough, M. E., & Timpano, K. R. (2012). Excessive reassurance seeking and anxiety pathology: Tests of incremental associations and directionality. *Journal of Anxiety Disorders*, *26*, 117-125.  
doi:10.1016/j.janxdis.2011.10.001
- Cozby, P. C. (1973). Self-disclosure: A literature review. *Psychological Bulletin*, *79*, 73-91.  
doi:10.1037/h0033950

- Crawford, J., Cayley, C., Lovibond, P. F., Wilson, P. H., & Hartley, C. (2011). Percentile norms and accompanying interval estimates from an Australian general adult population sample for self-report mood scales (BAI, BDI, CRSD, CES-D, DASS, DASS-21, STAI-X, STAI-Y, SRDS, and SRAS ). *Australian Psychologist*, *46*, 3-14. doi:10.1111/j.1742-9544.2010.00003.x
- Dam, A., Roelofs, J., & Muris, P. (2013). Correlates of co-rumination in non-clinical adolescents. *Journal of Child and Family Studies*, *22*, 1-6. doi:10.1007/s10826-012-9711-0
- Darcy, K., Davila, J., & Beck, J. (2005). Is Social Anxiety Associated With Both Interpersonal Avoidance and Interpersonal Dependence? *Cognitive Therapy and Research*, *29*, 171-186. doi:10.1007/s10608-005-3163-4
- Davila, J. (2001). Refining the association between excessive reassurance seeking and depressive symptoms: The role of related interpersonal constructs. *Journal of Social and Clinical Psychology*, *20*, 538-559. doi:10.1521/jscp.20.4.538.22394
- Davis, M. H. (1983). The effects of dispositional empathy on emotional reactions and helping: A multidimensional approach. *Journal of Personality*, *51*, 167-184. doi:10.1111/j.1467-6494.1983.tb00860.x
- Davis, R. N., & Nolen-Hoeksema, S. (2000). Cognitive inflexibility among ruminators and nonruminators. *Cognitive Therapy and Research*, *24*, 699-711. doi:10.1023/A:1005591412406
- Demir, M., & Urberg, K. A. (2004). Friendship and adjustment among adolescents. *Journal of Experimental Child Psychology*, *88*, 68-82. doi:10.1016/j.jecp.2004.02.006

- Dishion, T. J., Eddy, M., Haas, E., & Li, F. (1997). Friendships and violent behavior during adolescence. *Social Development, 6*, 207-223. doi:10.1111/j.1467-9507.1997.tb00102.x
- Dugas, M. J., Gagnon, F., Ladouceur, R., & Freeston, M. H. (1998). Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy, 36*, 215-226. doi:10.1016/S0005-7967(97)00070-3
- Dunkley, D. M., Blankstein, K. R., Zuroff, D. C., Lecce, S., & Hui, D. (2006). Self-Critical and Personal Standards factors of perfectionism located within the five-factor model of personality. *Personality and Individual Differences, 40*, 409-420. doi:10.1016/j.paid.2005.07.020
- D'Zurilla, T. J., & Nezu, A. M. (1990). Development and preliminary evaluation of the Social Problem-Solving Inventory. *Psychological Assessment, 2*, 156-163. doi:10.1037/1040-3590.2.2.156
- Egan, S. J., Wade, T. D., & Shafran, R. (2011). Perfectionism as a transdiagnostic process: A clinical review. *Clinical Psychology Review, 31*, 203-212. doi:10.1016/j.cpr.2010.04.009
- Enns, M. W., & Cox, B. J. (2002). The nature and assessment of perfectionism: A critical analysis. In G. L. Flett, P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 33-62). Washington, DC US: American Psychological Association. doi:10.1037/10458-002
- Enns, M. W., Cox, B. J., & Clara, I. (2002). Adaptive and maladaptive perfectionism: Developmental origins and association with depression proneness. *Personality and Individual Differences, 33*, 921-935. doi:10.1016/S0191-8869(01)00202-1

- Evraire, L. E., & Dozois, D. A. (2011). An integrative model of excessive reassurance seeking and negative feedback seeking in the development and maintenance of depression. *Clinical Psychology Review, 31*, 1291-1303. doi:10.1016/j.cpr.2011.07.014
- Ferdinand, R. F., Van der Reijden, M., Verhukst, F. C., Nienhuis, J., & Giel, R. (1995). Assessment of the prevalence of psychiatric disorder in young adults. *British Journal of Psychiatry, 166*, 480-488. doi:10.1192/bjp.166.4.480
- Frost, R. O., Heimberg, R. G., Holt, C. S., & Mattia, J. I. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences, 14*, 119-126. doi:10.1016/0191-8869(93)90181-2
- Gehlbach, H. (2004). A new perspective on perspective taking: A multidimensional approach to conceptualizing an aptitude. *Educational Psychology Review, 16*, 207-234. doi:10.1023/B:EDPR.0000034021.12899.11
- Gorski, J. J., & Young, M. A. (2002). Sociotropy/autonomy, self-construal, response style, and gender in adolescents. *Personality and Individual Differences, 32*, 463-478. doi:10.1016/S0191-8869(01)00048-4
- Haggard, D. L., Robert, C., & Rose, A. J. (2011). Co-rumination in the workplace: Adjustment trade-offs for men and women who engage in excessive discussions of workplace problems. *Journal of Business and Psychology, 26*, 27-40. doi:10.1007/s10869-010-9169-2
- Hammen, C. (2006). Stress generation in depression: Reflections on origins, research, and future directions. *Journal of Clinical Psychology, 62*, 1065-1082. doi:10.1002/jclp.20293

- Hankin, B. L., Mermelstein, R., & Roesch, L. (2007). Sex Differences in Adolescent Depression: Stress Exposure and Reactivity Models. *Child Development, 78*, 279-295.  
doi:10.1111/j.1467-8624.2007.00997.x
- Hankin, B. L., Stone, L., & Wright, P. (2010). Corumination, interpersonal stress generation, and internalizing symptoms: Accumulating effects and transactional influences in a multiwave study of adolescents. *Development and Psychopathology, 22*, 217-235.  
doi:10.1017/S0954579409990368
- Horn, P. J., & Wuyek, L. A. (2010). Anxiety disorders as a risk factor for subsequent depression. *International Journal of Psychiatry in Clinical Practice, 14*, 244-247.  
doi:10.3109/13651501.2010.487979
- Howell, A. J., & Watson, D. C. (2008). Judgments of impairment and distress associated with symptoms of internalizing and externalizing disorders. *Anxiety, Stress & Coping, 21*, 143-154. doi:10.1080/10615800701455973
- Ingram, R. E. (1990). Self-focused attention in clinical disorders: Review and conceptual model. *Psychological Bulletin, 107*, 156-176. doi:10.1037/0033-2909.107.2.156 .
- Jacobson, N. S., & Anderson, E. A. (1982). Interpersonal skill and depression in college students: An analysis of the timing of self-disclosures. *Behavior Therapy, 13*, 271-282.  
doi:10.1016/S0005-7894(82)80037-3
- Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*, 165-173. doi:10.1037/0021-843X.101.1.165

- Joiner, T. R., Katz, J., & Lew, A. (1999). Harbingers of depressotypic reassurance seeking: Negative life events, increased anxiety, and decreased self-esteem. *Personality and Social Psychology Bulletin*, *25*, 630-637. doi:10.1177/0146167299025005008
- Joiner, T. E., & Metalsky, G. I. (1995). A prospective test of an integrative interpersonal theory of depression: A naturalistic study of college roommates. *Journal of Personality and Social Psychology*, *69*, 778-788. doi:10.1037/0022-3514.69.4.778
- Joiner, T. R., & Metalsky, G. I. (2001). Excessive reassurance seeking: Delineating a risk factor involved in the development of depressive symptoms. *Psychological Science*, *12*, 371-378. doi:10.1111/1467-9280.00369
- Jose, P. E., Wilkins, H., & Spindelov, J. S. (2012). Does social anxiety predict rumination and co-rumination among adolescents? *Journal of Clinical Child and Adolescent Psychology*, *41*, 86-91. doi:10.1080/15374416.2012.632346
- Kendler, K. S., Myers, J., & Prescott, C. A. (2005). Sex differences in the relationship between social support and risk for major depression: A longitudinal study of opposite-sex twin pairs. *The American Journal of Psychiatry*, *162*, 250-256. doi:10.1176/appi.ajp.162.2.250
- Kessler, R. C., Chiu, W., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-Month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 617-627. doi:10.1001/archpsyc.62.6.617

- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 593-602. doi:10.1001/archpsyc.62.6.593
- Kessler, R. C., & Wang, P. S. (2009). Epidemiology of depression. In I. H. Gotlib, C. L. Hammen (Eds.), *Handbook of depression (2nd ed.)* (pp. 5-22). New York, NY US: Guilford Press.
- Koerner, N., & Dugas, M. J. (2006). A Cognitive Model of Generalized Anxiety Disorder: The Role of Intolerance of Uncertainty. In G. L. Davey, A. Wells (Eds.), *Worry and its psychological disorders: Theory, assessment and treatment* (pp. 201-216). Hoboken, NJ US: Wiley Publishing. doi:10.1002/9780470713143.ch12
- Larson, J. H., Hammond, C. H., & Harper, J. M. (1998). Perceived equity and intimacy in marriage. *Journal of Marital and Family Therapy*, *24*, 487-506. doi:10.1111/j.1752-0606.1998.tb01102.x
- Leaper, C., Tenenbaum, H. R., & Shaffer, T. (1999). Communication patterns of African American girls and boys from low-income, urban background. *Child Development*, *70*, 1489-1503. doi:10.1111/1467-8624.00108
- Li, T., Fok, H., & Fung, H. H. (2011). Is reciprocity always beneficial? Age differences in the association between support balance and life satisfaction. *Aging and Mental Health*, *15*, 541-547. doi:10.1080/13607863.2010.551340
- Liang, J., Krause, N. M., & Bennett, J. M. (2001). Social exchange and well-being: Is giving better than receiving? *Psychology and Aging*, *16*, 511-523. doi:10.1037/0882-7974.16.3.511



- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*, 335-343. doi:10.1016/0005-7967(94)00075-U
- Luppa, M. M., Sikorski, C. C., Luck, T. T., Ehreke, L. L., Konnopka, A. A., Wiese, B. B., & ... Riedel-Heller, S. G. (2012). Age- and gender-specific prevalence of depression in latest-life—Systematic review and meta-analysis. *Journal of Affective Disorders*, *136*, 212-221. doi:10.1016/j.jad.2010.11.033
- Luyten, P., Blatt, S. J., Van Houdenhove, B., & Corveleyn, J. (2006). Depression research and treatment: Are we skating to where the puck is going to be? *Clinical Psychology Review*, *26*, 985-999. doi:10.1016/j.cpr.2005.12.003
- Lyubomirsky, S., Kasri, F., Chang, O., & Chung, I. (2006). Ruminative response styles and delay of seeking diagnosis for breast cancer symptoms. *Journal of Social and Clinical Psychology*, *25*, 276-304. doi:10.1521/jscp.2006.25.3.276
- Lyubomirsky, S., Tucker, K. L., Caldwell, N. D., & Berg, K. (1999). Why ruminators are poor problem solvers: Clues from the phenomenology of dysphoric rumination. *Journal of Personality and Social Psychology*, *77*, 1041-1060. doi:10.1037/0022-3514.77.5.1041
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455–470. doi:10.1016/S0005-7967(97)10031-6
- Meleshko, K. G., & Alden, L. E. (1993). Anxiety and self-disclosure: Toward a motivational model. *Journal of Personality and Social Psychology*, *64*, 1000-1009. doi:10.1037/0022-3514.64.6.1000

- Mehl, M. R. (2006). The lay assessment of subclinical depression in daily life. *Psychological Assessment, 18*, 340-345. doi:10.1037/1040-3590.18.3.340
- Monroe, S. M., & Harkness, K. L. (2005). Life stress, the kindling hypothesis, and the recurrence of depression: Considerations from a life stress perspective. *Psychological Review, 112*, 417-445. doi:10.1037/0033-295X.112.2.417
- Monroe, S. M., & Harkness, K. L. (2011). Recurrence in major depression: A conceptual analysis. *Psychological Review, 118*, 655-674. doi:10.1037/a0025190
- Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin, 128*, 638-662. doi:10.1037/0033-2909.128.4.638
- Mor, N., Doane, L. D., Adam, E. K., Mineka, S., Zinbarg, R. E., Griffith, J. W., & ... Nazarian, M. (2010). Within-person variations in self-focused attention and negative affect in depression and anxiety: A diary study. *Cognition and Emotion, 24*, 48-62. doi:10.1080/02699930802499715
- Muthén, L. K., & Muthén, B. O. (1998-2007). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.
- Nicolai, K. A., Laney, T., & Mezulis, A. H. (2013). Different stressors, different strategies, different outcomes: How domain-specific stress responses differentially predict depressive symptoms among adolescents. *Journal of Youth and Adolescence, 42*, 1183-1193. doi:10.1007/s10964-012-9866-4
- Nolen-Hoeksema, S., & Davis, C. G. (1999). 'Thanks for sharing that': Ruminators and their social support networks. *Journal of Personality and Social Psychology, 77*, 801-814. doi:10.1037/0022-3514.77.4.801

- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*, 115–121. doi:10.1037/0022-3514.61.1.115.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*, 400-424. doi:10.1111/j.1745-6924.2008.00088.x
- Parrish, C. L., & Radomsky, A. S. (2010). Why do people seek reassurance and check repeatedly? An investigation of factors involved in compulsive behavior in OCD and depression. *Journal of Anxiety Disorders, 24*, 211-222. doi:10.1016/j.janxdis.2009.10.010
- Paxton, S. J., Schutz, H. K., Wertheim, E. H., & Muir, S. L. (1999). Friendship clique and peer influences on body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. *Journal of Abnormal Psychology, 108*, 255-266. doi:10.1037/0021-843X.108.2.255
- Peters, L. (2000). Discriminant validity of the Social Phobia and Anxiety Inventory (SPAI), the Social Phobia Scale (SPS) and the Social Interaction Anxiety Scale (SIAS). *Behaviour Research and Therapy, 38*, 943-950. doi:10.1016/S0005-7967(99)00131-X
- Pierce, G. R., Sarason, I. G., & Sarason, B. R. (1991). General and relationship-based perceptions of social support: Are two constructs better than one? *Journal of Personality and Social Psychology, 61*, 1028-1039. doi:10.1037/0022-3514.61.6.1028
- Pigott, T. A. (2003). Anxiety disorders in women. *Psychiatric Clinics of North America, 26*, 621-672. doi:10.1016/S0193-953X(03)00040-6

- Pine, D. S., Cohen, P., Gurley, D., Brook, J. & Ma, Y. (1998). The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. *Archives of General Psychiatry*, *55*, 56–64. doi:10.1001/archpsyc.55.1.56
- Potthoff, J. G., Holahan, C. J., & Joiner, T. E. (1995). Reassurance seeking, stress generation, and depressive symptoms: An integrative model. *Journal of Personality and Social Psychology*, *68*, 664-670. doi:10.1037/0022-3514.68.4.664
- Prinstein, M. J., Borelli, J. L., Cheah, C. L., Simon, V. A., & Aikins, J. (2005). Adolescent girls' interpersonal vulnerability to depressive symptoms: A longitudinal examination of reassurance-seeking and peer relationships. *Journal of Abnormal Psychology*, *114*, 676-688. doi:10.1037/0021-843X.114.4.676
- Raïche, G., Walls, T. A., Magis, D., Riopel, M., & Blais, J. (2013). Non-graphical solutions for Cattell's scree test. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*, *9*, 23-29. doi:10.1027/1614-2241/a000051
- Robichaud, M., & Dugas, M. J. (2005). Negative problem orientation (Part I): Psychometric properties of a new measure. *Behaviour Research and Therapy*, *43*, 391-401. doi:10.1016/j.brat.2004.02.007
- Rohde, P., Lewinsohn, P. M., & Seeley, J. R. (1994). Are adolescents changed by an episode of major depression? *Journal of the American Academy of Child and Adolescent Psychiatry*, *33*, 1289-1298. doi:10.1097/00004583-199411000-00010
- Rook, K. S., Pietromonaco, P. R., & Lewis, M. A. (1994). When are dysphoric individuals distressing to others and vice versa? Effects of friendship, similarity, and interaction task. *Journal of Personality and Social Psychology*, *67*, 548-559. doi:10.1037/0022-3514.67.3.548

- Rose, A. J. (2002). Co-rumination in the friendships of girls and boys. *Child Development, 73*, 1830-1843. doi:10.1111/1467-8624.00509
- Rose, A. J., Carlson, W., & Waller, E. M. (2007). Prospective associations of co-rumination with friendship and emotional adjustment: Considering the socioemotional trade-offs of co-rumination. *Developmental Psychology, 43*, 1019-1031. doi:10.1037/0012-1649.43.4.1019
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*, 98-131. doi:10.1037/0033-2909.132.1.98
- Rudiger, J. A., & Winstead, B. A. (2013). Body talk and body-related co-rumination: Associations with body image, eating attitudes, and psychological adjustment. *Body Image, 10*, 462-471. doi:10.1016/j.bodyim.2013.07.010
- Ruscher, S. M., & Gotlib, I. H. (1988). Marital interaction patterns of couples with and without a depressed partner. *Behavior Therapy, 19*, 455-470. doi:10.1016/S0005-7894(88)80016-9
- Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J. J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the USA: Results from the National Comorbidity Survey Replication. *Psychological Medicine, 38*, 15-28. doi:10.1017/S0033291707001699
- Salkovskis, P. M., & Warwick, H. M. (1986). Morbid preoccupations, health anxiety and reassurance: A cognitive-behavioural approach to hypochondriasis. *Behaviour Research and Therapy, 24*, 597-602. doi:10.1016/0005-7967(86)90041-0

- Saraceno, L., Munafó, M., Heron, J., Craddock, N., & van den Bree, M. M. (2009). Genetic and non-genetic influences on the development of co-occurring alcohol problem use and internalizing symptomatology in adolescence: A review. *Addiction, 104*, 1100-1121. doi:10.1111/j.1360-0443.2009.02571.x
- Schwartz-Mette, R. A., & Rose, A. J. (2009). Conversational self-focus in adolescent friendships: Observational assessment of an interpersonal process and relations with internalizing symptoms and friendship quality. *Journal of Social and Clinical Psychology, 28*, 1263-1297. doi:10.1521/jscp.2009.28.10.1263
- Schwartz-Mette, R. A., & Rose, A. J. (2012). Co-Rumination mediates contagion of internalizing symptoms within youths' friendships. *Developmental Psychology*, doi:10.1037/a0027484
- Shafran, R., & Mansell, W. (2001). Perfectionism and psychopathology: A review of research and treatment. *Clinical Psychology Review, 21*, 879-906. doi:10.1016/S0272-7358(00)00072-6
- Shaver, P. R., Schachner, D. A., & Mikulincer, M. (2005). Attachment style, excessive reassurance seeking, relationship processes, and depression. *Personality and Social Psychology Bulletin, 31*, 343-359. doi:10.1177/0146167204271709
- Silverstein, M., Chen, X., & Heller, K. (1996). Too much of a good thing? Intergenerational social support and the psychological well-being of older parents. *Journal of Marriage and the Family, 58*, 970-982. doi:10.2307/353984
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin, 129*, 216-269. doi:10.1037/0033-2909.129.2.216

- Smith, R. L., & Rose, A. J. (2011). The “cost of caring” in youths' friendships: Considering associations among social perspective taking, co-rumination, and empathetic distress. *Developmental Psychology, 47*, 1792-1803. doi:10.1037/a0025309
- Smith-Schrandt, H. L., Ojanen, T., Gesten, E., Feldman, M. A., & Calhoun, C. D. (2011). Beyond situational ambiguity in peer conflict: Unique and combined effects of cues from an antagonist and a best friend. *Child Development, 82*, 1921-1937. doi:10.1111/j.1467-8624.2011.01664.x
- Spasojević, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion, 1*, 25-37. doi:10.1037/1528-3542.1.1.25
- Starr, L. R., & Davila, J. (2008a). Differentiating interpersonal correlates of depressive symptoms and social anxiety in adolescence: Implications for models of comorbidity. *Journal of Clinical Child and Adolescent Psychology, 37*, 337-349. doi:10.1080/15374410801955854
- Starr, L. R., & Davila, J. (2008b). Excessive reassurance seeking, depression, and interpersonal rejection: A meta-analytic review. *Journal of Abnormal Psychology, 117*, 762-775. doi:10.1037/a0013866
- Starr, L. R., & Davila, J. (2009). Clarifying co-rumination: Associations with internalizing symptoms and romantic involvement among adolescent girls. *Journal of Adolescence, 32*, 19-37. doi:10.1016/j.adolescence.2007.12.005
- Stevens, E. A., & Prinstein, M. J. (2005). Peer Contagion of depressogenic attributional styles among adolescents: A longitudinal study. *Journal of Abnormal Child Psychology, 33*, 25-37. doi:10.1007/s10802-005-0931-2

- Stoeber, J., & Janssen, D. P. (2011). Perfectionism and coping with daily failures: Positive reframing helps achieve satisfaction at the end of the day. *Anxiety, Stress and Coping*, *24*, 477-497. doi:10.1080/10615806.2011.562977
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, & challenges. *Personality and Social Psychology Review*, *10*, 295-319.  
doi:10.1207/s15327957pspr1004\_2
- Stone, L. B., Hankin, B. L., Gibb, B. E., & Abela, J. Z. (2011). Co-rumination predicts the onset of depressive disorders during adolescence. *Journal of Abnormal Psychology*, *120*, 752-757. doi:10.1037/a0023384
- Strack, S., & Coyne, J. C. (1983). Social confirmation of dysphoria: Shared and private reactions to depression. *Journal of Personality and Social Psychology*, *44*, 798-806.  
doi:10.1037/0022-3514.44.4.798
- Strauss, C. C., Lahey, B. B., Frick, P., Frame, C. L., & Hynd, G. W. (1988). Peer social status of children with anxiety disorders. *Journal of Consulting and Clinical Psychology*, *56*, 137-141. doi:10.1037/0022-006X.56.1.137
- Tompkins, T. L., Hockett, A. R., Abraibesh, N., & Witt, J. L. (2011). A closer look at co-rumination: Gender, coping, peer functioning and internalizing/externalizing problems. *Journal of Adolescence*, *34*, 801-811. doi:10.1016/j.adolescence.2011.02.005
- Twenge, J. M., & Nolen-Hoeksema, S. (2002). Age, gender, race, socioeconomic status, and birth cohort difference on the children's depression inventory: A meta-analysis. *Journal of Abnormal Psychology*, *111*, 578-588. doi:10.1037/0021-843X.111.4.578
- Underwood, B., & Moore, B. (1982). Perspective-taking and altruism. *Psychological Bulletin*, *91*, 143-173. doi:10.1037/0033-2909.91.1.143



- Väänänen, A., Buunk, A. P., Kivimäki, M., Vahtera, J., & Koskenvuo, M. (2008). Change in reciprocity as a predictor of depressive symptoms: A prospective cohort study of Finnish women and men. *Social Science & Medicine*, *67*, 1907-1916.  
doi:10.1016/j.socscimed.2008.09.015
- Vangelisti, A. L., Knapp, M. L., & Daly, J. A. (1990). Conversational narcissism. *Communication Monographs*, *57*, 521-574. doi10.1080/03637759009376202
- Waller, E. M., & Rose, A. J. (2010). Adjustment trade-offs of co-rumination in mother-adolescent relationships. *Journal of Adolescence*, *33*, 487-497.  
doi:10.1016/j.adolescence.2009.06.002
- Waller, E. M., & Rose, A. J. (2013). Brief report: Adolescents' co-rumination with mothers, co-rumination with friends, and internalizing symptoms. *Journal of Adolescence*, *36*, 429-433. doi:10.1016/j.adolescence.2012.12.006
- Wang, P. S., Lane, M., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Twelve-month use of mental health services in the United States: Results from the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*, 629-640.  
doi:10.1001/archpsyc.62.6.629
- Ward, A., Lyubomirsky, S., Sousa, L., & Nolen-Hoeksema, S. (2003). Can't quite commit: Rumination and uncertainty. *Personality and Social Psychology Bulletin*, *29*, 96-107.  
doi:10.1177/0146167202238375
- White, M. E., & Shih, J. H. (2012). A daily diary study of co-rumination, stressful life events, and depressed mood in late adolescents. *Journal of Clinical Child and Adolescent Psychology*, *41*, 598-610. doi: 10.1080/15374416.2012.706518

- Weinstock, L. M., & Whisman, M. A. (2007). Rumination and excessive reassurance-seeking in depression: A cognitive-interpersonal integration. *Cognitive Therapy and Research, 31*, 333-342. doi:10.1007/s10608-006-9004-2
- Woodruff-Borden, J., Brothers, A. J., & Lister, S. C. (2001). Self-focused attention: Commonalities across psychopathologies and predictors. *Behavioural and Cognitive Psychotherapy, 29*, 169-178. doi:10.1017/S1352465801002041
- Ybema, J. F., Kuijer, R. G., Buunk, B. P., DeJong, G., & Sanderman, R. (2001). Depression and perceptions of inequity among couples facing cancer. *Personality and Social Psychology Bulletin, 27*, 3-13. doi:10.1177/0146167201271001

## **Appendices**

## Appendix A: Friendship, Communication & Validity Items

### Friendship Items

This study is about close friendships and some of the questions will ask you to think about your best friend.

It is important that you take a moment to think about who your best friend is. For the purposes of this study, we want you to think of your **closest same-gendered friend with whom you are NOT romantically involved**. So, if you are a woman - think of your closest female friend and if you are a man, please think of your closest male friend.

**Enter your best friend's first name ONLY:**

**NOTE: Your best friend's first name will be used in the survey questions to assist you in responding. The name will be used to make sure the questions are clear.**

1. About how long have you been friends with [name of best friend]?
2. Does [name of best friend] live in the same city as you?
3. How often do you see [name of best friend] in person?
4. Please estimate the **PERCENTAGE of your free time that you spend with [name of best friend]**, either hanging out in person or communicating in some way (e.g., on phone or via other digital means)?
5. How many close friends do you have?

### Communication Items

6. Please estimate **ON AVERAGE** how many **HOURS A WEEK** you spend **TALKING IN PERSON** with [name of best friend]
7. Please estimate **ON AVERAGE** how many **HOURS A WEEK** you spend **SPEAKING ON THE PHONE** with [name of best friend]
8. Please estimate **ON AVERAGE** how many **HOURS A WEEK** you spend **TEXTING** with [name of best friend]
9. Please estimate **ON AVERAGE** how many **HOURS A WEEK** you spend talking **VIA OTHER DIGITAL MEANS** (e.g., email, facebook, chatting)
10. Please indicate how often you talk to in the following ways. The most common method should be placed at the top and the least frequent way of communicating should be placed at the bottom
  - a. "In person"
  - b. "Talking on the phone"
  - c. "Texting on the phone"
  - d. "Video chat (e.g., Skype)"
  - e. "Online chatting"
  - f. "Email"
  - g. "While 'gaming'"
  - h. "Online messaging (e.g., Facebook)"

### **Validity Items**

1. Please put the same response that you picked for the question immediately before this one
2. What is your gender? (repeat question)
3. Are you paying attention?
4. Please pick the second response option, slightly characteristic or true of me
5. I am currently taking this survey and answering questions about my friend [friend's name].
6. I read these survey questions before selecting my responses.

## Appendix B: Co-rumination Questionnaire (CQ)

### When We Talk About Our Problems

**Think about the way you are with [name of best friend] when you "TALK" about YOUR problems** and indicate the number for each of the following statements that best describes how you and **[name of best friend]** talk about **YOUR** problems. Shortly, you will answer questions about how you talk about **[name of best friend]**'s problems. For the next eight questions, please focus on how you and **[name of best friend]** talk about **YOUR** problems. [Self-focused Items 1-8]

**"TALK" means communication in person, on the phone, via text, or through any digital means.**

#### Answer Scale for All Items

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

1. We talk about problems that **I** am having almost every time we see each other.
2. When we see each other, if **I** have a problem, we will talk about **my** problem even if we had planned to do something else together.  
*[Eliminated duplicate] When [name of best friend] has a problem, I always try really hard to keep my friend talking about it.*
3. When **I** have a problem, **[name of best friend]** always tries to get me to tell every detail about what happened.
4. When we talk about a problem that **I** have, we'll talk about every part of **my** problem over and over.
5. When we talk about a problem that **I** have, we talk about all of the reasons why **my** problem might have happened.
6. When we talk about a problem **I** have, we try to figure out every one of the bad things that might happen because of **my** problem.

7. When we talk about a problem **I** have, we spend a lot of time trying to figure out parts of **my** problem that we can't understand.
8. When we talk about a problem that **I** have, we talk a lot about how bad **I** feel.

Now, answer the next few questions about **how you and [name of best friend] talk about [NAME OF BEST FREIND]'s problems.**

**Remember: "TALK" means communication in person, on the phone, via text, or through any digital means.**

[Other-focused Items 9 - 16]

9. We talk about problems **[name of best friend]** is having almost every time we see each other.
10. When we see each other, if **[name of best friend]** has a problem, we will talk about the problem even if we had planned to do something else together.
11. When **[name of best friend]** has a problem, I always try really hard to keep **[name of best friend]** talking about it.  
*[Eliminated duplicate] When I have a problem, my friend always tries to get me to tell every detail about what happened.*
12. When we talk about a problem that **[name of best friend]** has, we'll talk about every part of the problem over and over.
13. When we talk about a problem that **[name of best friend]** has, we talk about all of the reasons why the problem might have happened.
14. When we talk about a problem that **[name of best friend]** has, we try to figure out every one of the bad things that might happen because of the problem.
15. When we talk about a problem that **[name of best friend]** has, we spend a lot of time trying to figure out parts of the problem that we can't understand.

16. When we talk about a problem that **[name of best friend]** has, we talk a lot about how bad the person with the problem feels.



## Appendix C: Depression Anxiety Stress Scales (DASS-42)

Please read each statement and select the appropriate response that indicates how much the statement applied to you over the PAST TWO WEEKS . There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

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

[Anxiety Items 1-14]

- 17. I was aware of dryness of my mouth
- 18. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)
- 19. I had a feeling of shakiness (e.g., legs going to give way)
- 20. I found myself in situations that made me so anxious I was most relieved when they ended
- 21. I had a feeling of faintness
- 22. I perspired noticeably (e.g., hands sweaty) in the absence of high temperatures or physical exertion
- 23. I felt scared without any good reason
- 24. I had difficulty in swallowing
- 25. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)
- 26. I felt I was close to panic
- 27. I feared that I would be "thrown" by some trivial but unfamiliar task
- 28. I felt terrified
- 29. I was worried about situations in which I might panic and make a fool of myself
- 30. I experienced trembling (e.g., in the hands)

[Depression Items 15-28]

- 31. I couldn't seem to experience any positive feeling at all
- 32. I just couldn't seem to get going
- 33. I felt that I had nothing to look forward to
- 34. I felt sad and depressed
- 35. I felt that I had lost interest in just about everything
- 36. I felt I wasn't worth much as a person
- 37. I felt that life wasn't worthwhile
- 38. I couldn't seem to get any enjoyment out of the things I did

39. I felt down-hearted and blue
40. I was unable to become enthusiastic about anything
41. I felt I was pretty worthless
42. I could see nothing in the future to be hopeful about
43. I felt that life was meaningless
44. I found it difficult to work up the initiative to do things

## **Appendix D: Social Interaction Anxiety Scale (SIAS)**

For each item, please indicate the degree to which you feel the statement is characteristic or true for you.

### **Answer Scale for All Items**

- (1) Not At All Characteristic or True of Me (2) Slightly Characteristic or True of Me  
(3) Moderately Characteristic or True of Me (4) Very Characteristic or True of Me  
(5) Extremely Characteristic or True of Me

1. I get nervous if I have to speak with someone in authority (teacher, boss, etc.).
2. I have difficulty making eye contact with others.
3. I become tense if I have to talk about myself or my feelings.
4. I find it difficult to mix comfortably with the people I work with.
5. I find it easy to make friends my own age.
6. I tense up if I meet an acquaintance in the street.
7. When mixing socially, I am uncomfortable.
8. I feel tense if I am alone with just one other person.
9. I am at ease meeting people at parties, etc.
10. I have difficulty talking with other people.
11. I find it easy to think of things to talk about.
12. I worry about expressing myself in case I appear awkward.
13. I find it difficult to disagree with another's point of view.
14. I have difficulty talking to attractive persons of the opposite sex.
15. I find myself worrying that I won't know what to say in social situations.
16. I am nervous mixing with people I don't know well.
17. I feel I'll say something embarrassing when talking.
18. When mixing in a group, I find myself worrying I will be ignored.
19. I am tense mixing in a group
20. I am unsure whether to greet someone I know only slightly.

## **Appendix E: Quality of Relationship Scale (QRI)**

Please describe your relationship with **[name of best friend]**.

### **Answer Scale for All Items**

(1) Not At All (2) A Little (3) Quite a bit (4) Very much

[Depth Items 1-6]

1. How positive a role does [name of best friend] play in your life?
2. How significant is your relationship with [name of best friend] in your life?
3. How close will your relationship be with [name of best friend] in 10 years?
4. How much would you miss [name of best friend] if the two of you could not see or talk with each other for a month?
5. How responsible do you feel for [name of best friend]'s well-being?
6. How much do you depend on [name of best friend]?

[Support Items 7-13]

7. To what extent can you count on [name of best friend] to give you honest feedback, even if you might not want to hear it?
8. To what extent could you count on [name of best friend] for help with a problem?
9. To what extent can you count on [name of best friend] to help you if a family member very close to you died?
10. To what extent could you turn to [name of best friend] for advice about problems?
11. If you wanted to go out and do something this evening, how confident are you that [name of best friend] would be willing to do something with you?
12. To what extent can you count on [name of best friend] to listen to you when you are very angry at someone else?
13. To what extent can you really count on [name of best friend] to distract you from your worries when you feel under stress?

## Appendix F: Response Styles Questionnaire (RSQ)

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

### Answer Scale for All Items

(1) Almost never (2) Sometimes (3) Often (4) Almost always

1. Think about how alone you feel
2. Think "I won't be able to do my job if I don't snap out of this."
3. Think about your feelings of fatigue and achiness
4. Think about how hard it is to concentrate
5. Think about how passive and unmotivated you feel
6. Analyze recent events to try to understand why you are depressed
7. Think about how you don't seem to feel anything anymore
8. Think, "Why can't I get going?"
9. Think, "Why do I always react this way?"
10. Go away by yourself and think about why you feel this way
11. Write down what you are thinking about and analyze it
12. Think about a recent situation, wishing it had gone better
13. Think, "Why do I have problems other people don't have?"
14. Think about how sad you feel
15. Think about all your shortcomings, failings, faults, mistakes
16. Think about how you don't feel up to doing anything
17. Analyze your personality to try to understand why you are depressed
18. Go someplace alone to think about your feelings
19. Think about how angry you are with yourself
20. Listen to sad music
21. Isolate yourself and think about the reasons why you feel sad

22. Try to understand yourself by focusing on your depressed feelings
23. Think, "What am I doing to deserve this?"
24. Think, "I won't be able to concentrate if I keep feeling this way."
25. Think, "Why can't I handle things better?"

## **Appendix G: Interpersonal Reactivity Index (IRI)**

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate response. **READ EACH ITEM CAREFULLY BEFORE RESPONDING.** Answer as honestly as you can.

### **Answer Scale for All Items**

(1) Does not describe me well    (2)    (3)    (4)    (5) Describes me very well

1. I sometimes find it difficult to see things from the "other guy's" point of view.
2. I try to look at everybody's side of a disagreement before I make a decision.
3. I sometimes try to understand my friends better by imagining how things look from their perspective.
4. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.
5. I believe that there are two sides to every question and try to look at them both.
6. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
7. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

## **Appendix H: Negative Problem Orientation Questionnaire (NPOQ)**

People react in different ways when faced with problems in their daily lives (e.g., health problems, arguments, lack of time, etc.). Please use the scale below to indicate to what extent each of the following items corresponds to the way you react or think when confronted with a problem. Please circle the number that best corresponds to you for each item.

### **Answer Scale for All Items**

(1) Not At All True of Me (2) Slightly True of Me (3) Moderately True of Me

(4) Very True of Me (5) Extremely True of Me

1. I see problems as a threat to my well-being
2. I often doubt my capacity to solve problems
3. Often before even trying to find a solution, I tell myself that it is difficult to solve problems
4. My problems often seem insurmountable
5. When I attempt to solve a problem, I often question my abilities
6. I often have the impression that my problems cannot be solved
7. Even if I manage to find some solutions to my problems, I doubt that they will be easily resolved
8. I have a tendency to see problems as a danger
9. My first reaction when faced with a problem is to question my abilities
10. I often see my problems as bigger than they really are
11. Even if I have looked at a problem from all possible angles, I still wonder if the solution I decided on will be effective
12. I consider problems to be obstacles that interfere with my functioning



## **Appendix I: Frost Multidimensional Perfectionism Scale (FMPS)**

Please indicate the number that best corresponds to your agreement with each item.

### **Answer Scale for All Items**

(1) Strongly disagree      (2)      (3)      (4)      (5) Strongly Agree

[Concern over Mistakes Items 1-9]

1. If I fail at work/school, I am a failure as a person.
2. I should be upset if I make a mistake.
3. If someone does a task at work/school better than me, then I feel like I failed the whole task.
4. If I fail partly, it is as bad as being a complete failure.
5. I hate being less than best at things.
6. People will probably think less of me if I make a mistake
7. If I do not do as well as other people, it means I am an inferior human being
8. If I do not do well all the time, people will not respect me
9. The fewer mistakes I make, the more people will like me

[Doubt over Actions Items 10-13]

10. Even when I do something very carefully, I often feel that it is not quite right
11. I usually have doubts about the simple everyday things I do
12. I tend to get behind in my work because I repeat things over and over
13. It takes me a long time to do something 'right'

## **Appendix J: Threat-related Reassurance Seeking Scale (TRSS)**

For the following questions, please select the answer most appropriate to you.

### **Answer Scale for All Items**

(1) no, not at all   (2)   (3)   (4)   (5)   (6)   (7) yes, very much

#### [General Threat Items 1-4]

1. Do you find yourself often asking others whether everything will be alright?
2. Do you frequently seek reassurance from others as to whether something bad is going to happen?
3. If you suspect something bad might happen, do you seek reassurance from others?
4. Do you need reassurance from others that everything will be alright?

#### [Evaluative Threat Items 5 – 8]

5. Do you find yourself often asking others whether there is something wrong with you (for example, your appearance, behavior, personality, or intelligence)?
6. If you suspect there might be something wrong with you (for example, your appearance, behavior, personality, or intelligence), do you seek reassurance from others?
7. Do you frequently seek reassurance from others as to whether there is something wrong with you (for example, your appearance, behavior, personality, or intelligence)?
8. Do you need reassurance from others that there is nothing is wrong with you (for example, your appearance, behavior, personality, or intelligence)?

## **Appendix K: Informed Consent to Participate in Research**

### **Information to Consider Before Taking Part in this Research Study**

Researchers at the University of South Florida (USF) study many topics. To do this, we need the help of people who agree to take part in a research study. We are asking you to take part in a research study that is called: How individual traits and emotional adjustment relate to problem talk with friends.

The person who is in charge of this research study is Heather Smith-Schrandt, M.A. This person is called the Principal Investigator. In this study, the Principal Investigator will be primarily responsible for this research. The Principal Investigator's Faculty Advisor, Ellis Gesten, Ph.D., and his research team may have access to data, but this data will not contain any information that identifies you to any study personnel.

The research will be done online at the website you are currently visiting, from a location and at a time of your choosing.

### **Purpose of the Study**

The purpose of this study is to:

- Explore individual differences, or personality traits, that influence how one discusses problems with their best friend
- Determine how friends divide, or share, problem related discussion
- Understand how problem talk between friends influences emotional adjustment
- This study is being completed for a Doctoral Dissertation, and is being conducted by a clinical psychology graduate student.

### **Inclusionary/Exclusionary Criteria**

Research studies sometimes are looking for certain types of people to participate. In order to participate in this study, you must be:

- 18+ years of age;
- A student at the University of South Florida (or identified as best friend of a student at University of South Florida);
- Fluent in written English.

There are no other inclusionary/exclusionary criteria for this study.

### **Study Procedures**

If you take part in this study, you will be asked to:

- Read over this page containing consent information that describes all of the study procedures. If you have questions concerning the study, you are encouraged to call or email the Principal Investigator before participating.
  
- If you consent to participate, you may be asked to complete several questionnaires:
  - One questionnaire asking basic demographic information.
  - You will be asked for the first name of your best friend (of your same gender). This name will then be inserted into items to help you answers questions about this friendship and how you and your best friend talk about problems.
  - Three questionnaires about emotional adjustment.
  - Six questionnaires about individual, or personality, traits such as how you typically handle and think about problems and emotions.
  
- If you are a student at the University of South Florida, you will have the option of providing your best friend an opportunity to also participate
  - After viewing an email that can be sent describing participation, your options will be:
    - Provide your best friend's email address so an automated email can be sent
    - Provide your email address so you can forward an email to your best friend
    - Copy and paste text manually into an email to sent to your best friend
    - Do NOT provide your best friend with the opportunity to participate
  - Your choice to forward, send, or not contact your best friend does NOT impact your award of extra credit.
  - Any supplied email addresses will be kept confidential and deleted at the end of data collection.
  - At most, three emails will be sent describing and providing a link to the study
  - Your responses to the survey will not be shared with your best friend.
  - Your first name only will appear in the email if you choose to send an email to your best friend so they can consider participation.

This study will be completed in one session at a time and location of your choosing. This study will be completed entirely online, at this website. This session will last approximately 30-60 minutes.

### **Alternatives**

You have the alternative to choose not to participate in this research study. If you choose not to participate, please close your browser window at this time. If you choose not to participate in this study, but are hoping to receive extra credit towards a psychology course, you can choose to participate in another research study with a similar time commitment. You may also wish to speak to the professor of your psychology course to find other options to receive extra credit in his/her course.

### **Benefits**

We do not know if you will get any benefits by taking part in this study.

## **Risks or Discomfort**

You may feel uncomfortable answering questions regarding your emotions, thoughts, and friendship. If you feel uncomfortable at any point and wish to stop your participation in the study, you are free to do so.

## **Compensation**

We will not pay you for the time you volunteer while being in this study. However,

- If you are a psychology student at the University of South Florida, you will receive extra credit towards a psychology course of your choice.
  - You will receive 1/2 point for every 30 minutes of participation (or fraction thereof).
  - If you decide to stop participating before you finish the study, you will receive extra credit at this same rate, based on the amount of time you have spent participating in the study.
  - You will be credited with your points within 24 hours of participation.
  - Your extra credit is not based on your best friend's participation

If you are a non-student participant, a charitable donation of \$5 will be made to National Alliance on Mental Health ([http://www.nami.org/template.cfm?section=About\\_NAMI](http://www.nami.org/template.cfm?section=About_NAMI)). Total donation will not exceed \$500.

## **Confidentiality**

We must keep your study records confidential. No information that identifies who you are, like your name or student ID, will be retained once extra credit has been awarded. Instead, a code number will be assigned to your data. Electronic study data will be kept on password protected servers. All researchers are well-trained with respect to confidentiality.

Your first name only may be used in an email requesting your best friend's participation in the survey if you choose to have an email sent to your best friend.

However, certain people may need to see your study records. By law, anyone who looks at your records must keep them completely confidential. The only people who will be allowed to see these records are:

- The research team, including the Principal Investigator and all other research staff.
- Certain government and university people who need to know more about the study. For example, individuals who provide oversight on this study may need to look at your records. This is done to make sure that we are doing the study in the right way. They also need to make sure that we are protecting your rights and your safety. These include:
  - The University of South Florida Institutional Review Board (IRB) and the staff that work for the IRB. Other individuals who work for USF that provide other kinds of oversight may also need to look at your records.
  - The Department of Health and Human Services (DHHS).

We may publish what we learn from this study. If we do, we will not let anyone know your name or publish anything else that would let people know who you are.

### **Voluntary Participation / Withdrawal**

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study to please the investigator or the research staff. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are entitled to receive if you stop taking part in this study. In addition, your decision to participate or not to participate will not affect your student status.

### **Questions, Concerns, or Complaints**

If you have any questions, concerns or complaints about this study, contact Heather Smith-Schrandt by phone or email. If you would like to speak to Heather's faculty advisor, you may contact Ellis Gesten by phone or email.

If you have questions about your rights as a participant in this study, general questions, or have complaints, concerns or issues you want to discuss with someone outside the research, call the Division of Research Integrity and Compliance of the University of South Florida.

### **Consent to Take Part in this Research Study**

It is up to you to decide whether you want to take part in this study.

If you want to take part, please click the YES button below, if the following statements are true.

By clicking the YES button, I acknowledge that I freely give my consent to take part in this study. I understand that by clicking this button, I am agreeing to take part in research. Clicking this button certifies that I understand the requirements, risks, and benefits of this research. I may print a copy of this form for my records at this time if I desire (File > Print or Ctrl-V).

### **Would you like to participate in the survey?**

- Yes, start survey**

## Appendix L: IRB Approval

August 14, 2012

Heather Smith-Schrandt  
Psychology  
4202 E. Fowler PCD  
Tampa, FL 33612

RE: **Expedited Approval** for Initial Review

IRB#: Pro00008971

Title: How individual traits and emotional adjustment relate to problem talk with friends

Dear Ms. Smith-Schrandt:

On 8/13/2012 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 8/13/2013.

### **Approved Items:**

#### **Protocol Document(s):**

[Smith-Schrandt dissertation proposal.docx](#)

#### **Consent/Assent Documents:**

Online Consent form granted a Waiver

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your study qualifies for a waiver of the requirements for the documentation of informed consent as outlined in the federal regulations at **45 CFR 46.117 (c)**: An IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either: (1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; or (2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required


outside of the research context

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

John Schinka, PhD, Chairperson  
USF Institutional Review Board





## Appendix M: Summary of Measures

**Table M1.** Summary of Measures in Order Presented

Construct	Measure	Items	Alpha	Description	Appendix
Participant characteristics	N/A	15	N/A	Information about demographics, friendship, and communication	A
Friendship quality	Quality of Relationships Scale (QRI)	12	.87	Support (e.g., "to what extent can you count on your friend to help you inf a family member very close to your died?") and Depth (e.g., "How significant is this relationship in your life?")	E
Self-focused co-rumination	Co-rumination Questionnaire (CQ)	8	.90	Adapted to reflect co-rumination about one's own problems (e.g., "We talk about problems that I am having almost every time we see each other.")	B
Other-focused co-rumination	Co-rumination Questionnaire (CQ)	8	.91	Adapted to reflect co-rumination about a best friend's problems (e.g., "16. When we talk about a problem that [name of best friend] has, we talk a lot about how bad the person with the problem feels.")	B
Excessive reassurance seeking	Threat-related Reassurance Seeking Scale (TRSS)	8	.94	Reassurance seeking regarding general (e.g., "do you need reassurance for others that there is nothing wrong with you?) and social evaluative concerns (e.g., "do you frequently seek reassurance from others as to whether something bad is going to happen?)	I
Negative problem orientation	Negative Problem Orientation Questionnaire (NPOQ)	12	.93	Tendency to view problems as threatening (e.g., "I see problems as a threat to my well-being"), doubt problem-solving ability (e.g., "I often doubt my capacity to solve problems"), and predict problem irresolution (e.g., "my problems often seem insurmountable")	H
Social perspective taking ability	Interpersonal Reactivity Index (IRI)	7	.96	Tendency to infer others' viewpoints (e.g., "I sometimes try to understand my friends better by imagining how things look from their perspective")	G

**Table M1 (Continued)**

<b>Construct</b>	<b>Measure</b>	<b>Items</b>	<b>Alpha</b>	<b>Description</b>	<b>Appendix</b>
Perfectionism	Frost Multidimensional Perfectionism Scale (FMPS)	13	.92	Concern about mistakes (e.g., "I should be upset if I make a mistake") and doubts over actions (e.g., "I usually have doubts about the simple everyday things I do")	J
Rumination	Rumination	25	.96	Rumination regarding self (e.g., "why am I the only one with problems"), symptoms (e.g., "I am always tired"), and causes/consequences of depressed mood (e.g., "I won't be able to work because I feel so badly")	F
Co-rumination Balance	Direct face-valid item assessing balance of self- and other-focused problem discussion (omitted option of total balance)	1	N/A	"How do you and [best friend] discuss problems?" we focus... (4) almost always (3) much more (2) more (1) slightly more on my problems (-1) slightly more (-2) more (-3) much more (-4) almost always on [best friend's] problems	Method section
Social Anxiety	Social Interaction Anxiety Scale (SIAS)	20	.93	fear and avoidance of social situations because of worry about social evaluation or interpersonal rejection(e.g., "when mixing socially, I am uncomfortable", see Appendix D)	D
Depression	Depression, Anxiety, Stress Scales (DASS)	14	.95	depressive symptoms (e.g., "I felt that life wasn't worthwhile")	C
Anxiety	Depression, Anxiety, Stress Scales (DASS)	14	.87	anxious symptoms (e.g., "I felt scared without any good reason")	C

*Note.* Survey questions were presented in a standard order (as presented here) for each participant