RUMINATION AS A MEDIATOR OF ATTACHMENT ANXIETY AND
SYMPTOMS OF DEPRESSION AND ANXIETY AMONG WOMEN

A Dissertation in
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by
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ABSTRACT

The objective of this study was to examine whether rumination served as a mediator of attachment anxiety and psychological distress among university women. Two overarching mediational models were examined: (a) Rumination as a mediator of the association between attachment anxiety and depressive symptoms and (b) Rumination as a mediator of the link between attachment anxiety and anxiety symptoms. In the second model, two sub-models were examined: one predicting trait anxiety (a more stable and enduring personality characteristic) as an outcome, and the second predicting state anxiety (momentary, situationally-based experiences of anxiety). Each variable was assessed using quantitative self-report measures completed by female students (n = 123) at three universities in the United States. The Baron and Kenny (1986) method of testing mediation was used. Results showed that rumination fully mediated the relation between attachment anxiety and two of the outcome variables (depressive symptoms, trait anxiety symptoms) and partially mediated the relation between attachment anxiety and state anxiety. Tests of reverse mediational models were analyzed to rule out the possibility that symptoms were causing brooding rumination, which in turn was influencing attachment anxiety. Tests of these models, however, suggested that it was not possible to rule out reverse mediation. Conclusions and implications for clinical work and future research are discussed.
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Dr. Susan Woodhouse shared with me recently that she saw the movie "The Way" about the pilgrimage to Santiago de Compostela, a trail in Spain I walked a couple of years ago. Susan shared the following: “I noticed that the pilgrims underwent subtle changes—typically not the ones they had expected to achieve, but other more important ones. I was thinking about how this dissertation completion process is a bit like that kind of pilgrimage...a very long arduous journey, with many unexpected subtle changes. Your efforts are worth it. Buen Camino.” I couldn’t have said it better myself. Thank you, Susan.
CHAPTER 1
INTRODUCTION

The present study will examine rumination as a mediator of attachment anxiety and psychological distress in adults. Previous research has shown that attachment anxiety is linked to various forms of psychological distress including depression and anxiety (Mallinckrodt & Wei, 2005; Wei, Heppner, & Mallinckrodt, 2003; Vogel & Wei, 2005; Mikulincer & Shaver, 2007). The links between attachment anxiety and rumination, and rumination and distress (i.e., depression, anxiety) have also been empirically supported in previous studies (Mikulincer & Florian, 1998; Clark & Wells, 1995; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Specific mediators of the link between attachment anxiety and depressive symptoms have been studied (Saffrey & Ehrenberg, 2007); however, mediators of the link between attachment anxiety and anxiety symptoms have not yet been examined. The present study will investigate two overarching mediational models. The first model will seek to replicate previous research (Saffrey & Ehrenberg, 2007) by examining rumination as a mediator of attachment anxiety and depressive symptoms. The second model will seek to extend previous research by examining rumination as a mediator of the link between attachment anxiety and anxiety symptoms. In this model, two sub-models will be examined: one predicting trait anxiety (a more stable and enduring personality characteristic) as an outcome, and the second predicting state anxiety (momentary, situationally based experiences of anxiety).

John Bowlby, the founder of attachment theory, theorized that there is a link between attachment insecurity and forms of psychological distress such as depression
and anxiety (Bowlby, 1973, 1982). Bowlby (1980) conceptualized the attachment relationship between an infant and its caregiver early in life as impacting the infant’s perceptions, thoughts, and feelings later in life. Further, Bowlby suggested that the inability to form a secure relationship with one’s caregiver could lead one to develop an internalized working model of oneself as unlovable and of others as untrustworthy. As a result of these internalized working models of attachment, even in adulthood people with insecure early attachments may tend to have negative perceptions of both themselves and others (Dozier, Stovall-McClough & Albus, 1969/1982; 1980). For instance, an individual who has had experiences early in life in which primary caregivers were either inconsistent or non-responsive to his or her needs may develop into an adult with an insecure attachment. Such individuals may respond in adulthood to situations with behaviors characteristic of insecure attachment in order to obtain a sense of security. These individuals may also be more likely to experience forms of psychological distress, due to their negative mental representations of self and other (Mikulincer & Shaver, 2005). In fact, empirical research has found support for the idea that insecure attachment is associated with higher levels of psychological symptoms (Mallinckrodt & Wei, 2005).

Adult attachment is currently conceptualized in terms of two dimensions: attachment anxiety and attachment avoidance (Brennan, et al., 1998). Attachment anxiety is characterized by an adult’s preoccupation with separation, abandonment, and insufficient love. Attachment avoidance is characterized by discomfort with closeness in relationships. Both attachment anxiety and attachment avoidance have been found to relate to distress in empirical studies (Mallinckrodt & Wei, 2005; Wei,
et al., 2003; Vogel & Wei, 2005). Although the relations between attachment anxiety and avoidance and distress have been well documented, the pathways have only been partially explained by meditational models (Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Wei, et al., 2003; Wei, Heppner, Russell, & Young, 2006). Rumination is one factor that has been found to partially mediate the relationship between attachment anxiety and depressive symptoms (Saffrey & Ehrenberg, 2007). Rumination is defined as “a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and the possible causes and consequences of these symptoms” (Nolen-Hoeksema, Wisco & Lyubomirsky, 2008, p.400).

Nolen-Hoeksema (1991) developed a theory of depression known as response styles theory (RST). This theory describes rumination as a factor that increases the likelihood of developing and maintaining depressive symptoms. Since the development of RST, rumination has been found to relate to forms of psychological distress including depression and anxiety in multiple studies over the past three decades (for reviews see Nolen-Hoeksema et al., 2008 and Watkins, 2008; Just & Alloy, 1997; Kuehner & Weber, 1999; Nolen-Hoeksema, 2000; Fresco, Frankel, Mennin, Turk, & Heimberg, 2002).

Studies have also examined rumination as a mediator of the relation between attachment anxiety and forms of psychological distress (Burnette, Davis, Green, Worthington & Bradfield, 2009; Collins, Ford, Guichard, & Allard, 2006; Lindsay, 2008). Recently, Saffrey and Ehrenberg (2007) examined rumination as a mediator of the link between attachment anxiety and depressive symptoms among young adults.
The authors concluded that rumination partially mediated the link between attachment anxiety and depressive symptoms.

Although the study by Saffrey and Ehrenberg (2007) provided insight into how attachment anxiety is linked to depression, several gaps in the research remain. First, although attachment was assessed by Saffrey and Ehrenberg, it was only assessed in the context of relationship breakups. Moreover, rumination as a mediator of the link between attachment anxiety and anxiety symptoms has not been examined empirically. Considering the role of rumination as a mediator between attachment anxiety and anxiety symptoms may be important in the treatment of anxiety symptoms. This is important given that it is estimated that 18.1% of adults in the United States have anxiety disorders (Kessler, Chiu, Demler & Walters, 2005).

The present study will seek to extend and replicate the findings of Saffrey and Ehrenberg (2007) in several ways. First, in order to replicate their findings, rumination will be examined as a mediator of the link between attachment anxiety and depressive symptoms. Since the study by Saffrey and Ehrenberg focused on participants who had been through a recent romantic relationship break-up, a fact that may have limited the results to this specific subpopulation. the present study will seek to examine attachment among participants who have not specifically been through a recent romantic break-up. Also, in order to improve on previous research methodologically, the present study will use measures that have better psychometric properties than those used in the earlier study. However, the primary purpose of the present study is to extend the findings of Saffrey and Ehrenberg beyond assessing rumination as a mediator between attachment anxiety and depressive symptoms by examining rumination as a mediator of attachment
anxiety and anxiety symptoms. The current study is the first to examine such a mediational model.

**Attachment**

According to John Bowlby (1988), attachment relationships develop between infants and their caregivers as a result of the caregiver’s responsiveness to an infant in times of distress, for example the degree to which a caregiver provides protection and support when needed. The attachment figure serves as a secure base from which an infant can explore its environment and as a safe haven to which the infant can safely return (Bowlby, 1982). Bowlby theorized that the early experiences between an infant and its caregiver during times of distress or fear activate the infant’s attachment system. Over time, these interactions result in an infant’s formation of a secure or insecure attachment to its caregiver (Bowlby, 1969).

Bowlby theorized that the type of attachment pattern formed at an early age can affect an individual later in life. As stated earlier, attachment can be carried into adulthood through internal working models of attachment. Internal working models are mental representations an individual has of himself or herself and others based on his or her experiences. These internal working models of attachment guide an individual’s perception of his or her world and experiences (Bowlby, 1982; 1988). In fact, research has shown that in adulthood, attachment can influence the way an adult responds to a real or perceived psychological threat (Hazan & Shaver, 1987). Adult attachment has been empirically shown to be important in the context of one’s relationship with one’s romantic partner. For example, in adulthood, individuals may obtain support from mental representations of romantic partners as a way to obtain a sense of security and
safety in the absence of the actual partner (Schachner, 2006). Mental representations of
romantic partners can provide an individual with a sense of security and safety in
absence of an actual person (Mikulincer & Shaver, 2004; Mikulincer & Shaver, 2007).

**Dimensions of Attachment (Anxiety and Avoidance)**

One of the central ways in which attachment in adulthood is currently
conceptualized is in terms of romantic attachment. Unlike infant/child-parent
relationships, which are fairly asymmetrical, adult relationships tend to be reciprocal,
with both partners at times receiving care from and giving care to one another (Weiss,
1982). Further, when a secure adult’s attachment system is activated by a real or
perceived physical or psychological threat, his or her behavior is not necessarily
characterized by physical proximity-seeking as is often common among securely
attached infants. Adults may rely on mental representations of their romantic partners
or other attachment figures to provide a sense of security and safety when an actual
person is not available (Mikulincer & Shaver, 2004; Mikulincer & Shaver, 2007).

There are two dimensions of adult attachment, attachment *anxiety* and
attachment *avoidance* (Brennan et al., 1998). Attachment anxiety is defined in terms
of a preoccupation with separation, abandonment, and insufficient love. Attachment
anxiety is often accompanied by the fear that one’s attachment figure (e.g., romantic
partner) will not be available during times of need (Brennan et al., 1998). Attachment
avoidance, on the other hand, is characterized by a person’s feelings of unease with
closeness in romantic relationships. Avoidance is often accompanied by an increased
emotional distance from one’s partner (Brennan et al., 1998).

Attachment anxiety and attachment avoidance are characterized by
hyperactivating and deactivating strategies of emotion regulation, respectively. Those who are high in attachment anxiety are theorized to experience hyperactivation of emotion as a way to manage symptoms of distress and to get one’s attachment needs met (Cassidy & Kobak, 1988). Behaviors associated with hyperactivating strategies include clingy and controlling responses towards one’s partner. These individuals who are high in attachment anxiety are overly concerned with the proximity of their attachment figures and frequently attempt to obtain support in an effort to obtain a feeling of security (Cassidy & Kobak, 1998; Mikulincer & Shaver, 2003; Shaver &Hazan, 1993). In addition, individuals high in attachment anxiety tend to experience and express distress vividly. Attachment avoidance, in contrast, is characterized by deactivating strategies of emotion regulation, which include minimization of affect, interpersonal distancing, and avoidance of intimacy (Cassidy & Kobak, 1998). Those high in attachment avoidance have been empirically shown to deactivate their attachment system by trying to actively avoid certain thoughts or feelings that are distressing (Shaver & Mikulincer, 2002).

**Attachment and psychological distress.** In the early stages of the development of attachment theory, Bowlby (1973, 1982) proposed a link between attachment insecurity and symptoms of distress such as depression and anxiety. This theory has been evaluated in numerous studies in recent decades with consistent findings that attachment insecurity is related to increased distress (Fuendeling, 1998; for a review see Mallinckrodt & Wei, 2005; Vogel & Wei, 2005). This body of research includes empirical studies that found both attachment anxiety and attachment avoidance were related to increased symptoms of psychological distress.
(Mallinckrodt & Wei, 2005; Wei, et al., 2003; Vogel & Wei, 2005; Fuendeling, 1998).

The link between attachment insecurity (i.e., high levels of attachment avoidance and/or attachment anxiety) and psychological distress has been examined by evaluating specific mediators. Support has been found for a number of constructs proposed as mediators of the link between attachment insecurity and distress including social competence (Mallinckrodt & Wei, 2005), social support (Mallinckrodt & Wei, 2005; Larose & Bernier, 2001), perfectionism and ineffective coping (Wei, Heppner, Russell, & Young, 2006), and perceived coping (Wei, et al., 2003). Several studies have also examined rumination as a mediator of the link between attachment insecurity and distress (Burnette, Davis, & Green, 2009; Saffrey & Ehrenberg, 2007). Saffrey and Ehrenberg examined rumination as a mediator of the link between attachment anxiety in particular and distress. Findings showed that rumination partially mediated the relation between attachment anxiety and depressive symptoms (Saffrey & Ehrenberg).

**Response Styles Theory (RST and Rumination)**

Response styles theory (RST) is a theory developed by Nolen-Hoeksema (1991). According to response styles theory, one’s style of rumination can impact the development and maintenance of depressive symptoms. Response styles theory also posits distraction as a way individuals cope with a depressed mood or negative thoughts. Recent research, under the umbrella of response styles theory, however, has placed a greater emphasis on the type of rumination an individual uses, as opposed to the degree to which she or he uses distraction (Nolen-Hoeksema et. al., 2008). Evaluating the
different types of rumination as they relate to psychological distress in different ways has been of particular focus (Saffrey & Ehrenberg, 2007; Nolen-Hoeksema et al., 2008). A history of the development of conceptualizations of rumination and its subtypes is provided below.

The definition of rumination has been refined over the years. Response styles theory (RST) originally defined rumination as the way individuals focus their attention on depressive symptoms experienced and what they think will happen as a result of those symptoms (Nolen-Hoeksema, 1991). Nolen-Hoeksema and colleagues (2008) refined that definition and currently define rumination as “a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and the possible causes and consequences of these symptoms” (Nolen-Hoeksema et al., 2008, p.400).

Treynor, Gonzalez, and Nolen-Hoeksema (2003) determined that there are two distinct types of rumination, which relate differently to depressive symptoms. These two types of rumination are labeled *brooding* and *reflection* (also referred to as *reflective pondering*). Brooding rumination captures a type of rumination that tends to be negative, maladaptive, and is associated with depressive symptoms (Treynor et al., 2003). Brooding has also been described as a type of *moody pondering* in which a person focuses on his/her negative thoughts related to his/her depressed mood (Woolf, 1981). One of the key characteristics of brooding is that it tends to capture a style of rumination containing negative thought content. Reflection, on the other hand, is a style of rumination in which an individual thinks about his or her current problem in a reflective way that tends to be more problem-
solving in nature. Although findings are mixed on the adaptive aspects of reflection, most research has shown that reflection is usually adaptive and associated with positive outcomes (Fresco, Auerback, & Abela, 2004).

Rumination can increase individuals’ depressive symptoms not only by focusing attention on negative thoughts, but also by interfering with one’s problem solving abilities and abilities to distract oneself from one’s mood (Nolen-Hoeksema, 1991). The idea that certain styles of rumination may be associated with depression may not be surprising given that rumination styles have been linked to increased pessimistic thinking, negative-based memories, lower optimism and fewer problem-solving abilities (Nolen-Hoeksema, 1991).

Many studies have supported the RST of depression with findings that various types of rumination are linked to forms of psychological distress. In a study of undergraduates, rumination was found to be one of the common factors associated with vulnerability to depression (Ito, Takenaka, & Agari, 2005). Rumination style has been studied in clinical samples as well, with similar findings. For example, participants who were clinically depressed with a major depressive episode diagnosis were shown to have a greater risk for rumination than non-depressed adults (Kuehner & Weber, 1999). Studies have also examined the brooding style of rumination specifically and found it to relate to depression (Burwell & Shirk, 2007; Joorman, Dkane, & Gotlib, 2006; Treynor et al., 2003; Nolen-Hoeksema et al., 2008; Saffrey & Ehrenberg, 2007; Siegle et al., 2004). Although RST was initially intended to explain depression, it has also been used to conceptualize rumination as it relates to anxiety. Numerous studies have shown that it is linked to greater anxiety (Fresno, et al., 2002; Lyubomirsky &
Nolen-Hoeksema, 2003; Muris, Roelofs, Rassin, Franken, & Mayer, 2005; Roelofs, Rood, Meesters, Dorsthorst, Bogels, Alloy & Nolen-Hoeksema, 2009; Sarin, Abela, & Auerbach, 2005). Brooding rumination has also been examined as a type of rumination found to relate to heightened anxiety (Nolen-Hoeksema, 2000; Segerstrom, Tsao, Alden, & Craske, 2000).

**Attachment and Rumination**

Bowlby theorized that attachment is related to cognition, as well as to perceptions of social interactions, affect, and behavior (1969/1982). Indeed, research has found that attachment insecurity is associated with maladaptive thinking processes (Thompson and Zuroff, 1999; Batgos & Leadbeater, 1994; for a review see Mikulincer & Shaver, 2007). In fact, research has shown that attachment is linked to a number of different cognitive processes. When reviewing the research on the cognitive processes of people with generalized anxiety disorder (GAD), Cassidy (1995) determined that empirical evidence suggested individuals who have an insecure attachment tend to exhibit attentional biases, task interferences, problematic cognitive beliefs, and interpretation of ambiguous stimuli. These findings suggest that adult attachment and individuals’ cognitive style think may impact anxiety symptoms.

In a comprehensive review of empirical studies on attachment and psychological distress, Mikulincer and Shaver (2007) found that adults high in attachment anxiety were more likely than those low in attachment anxiety to engage in obsessive rumination about social situations and relationships. Similarly, adults high in attachment anxiety may be more likely than those low in attachment anxiety to
ruminate due to their insecure internal working models of self and other (Saffrey & Ehrenberg, 2007). Another explanation is that attachment anxiety is characterized by hyperactivating strategies of emotion regulation, and rumination is a type of hyperactivation (Mikulincer & Shaver, 2007, Main, 1990) because of the increased attention to negative affect during rumination. Related research on attachment and rumination has shown that attachment anxiety (as opposed to attachment avoidance) is characterized by an increase in negative thinking (Mikulincer & Shaver, 2007) and is linked to the cognitive processes associated with rumination (Fuendeling, 1998; Mikulincer & Florian, 1998).

Research on rumination has included some studies that are guided by RST, and others that are not (Garnefski, Kraaij, & Spinhoven, 2001; Beckman & Kellmann, 2004; Alloy, Abramson, Hogan, Whitehouse, Rose, Robinson, et al., 2000). Although rumination has been conceptualized and studied in different ways, there is reason to believe that the use of RST to conceptualize rumination may be advantageous in future research because of its focus on the distinctions between types of rumination. Because the two types of rumination are differentially related to psychological distress (Nolen-Hoeksema et al., 2008), it may be informative to examine subtypes of rumination rather than collapsing them.

**The Present Study**

Saffrey and Ehrenberg (2007) found that in the context of a recent romantic relationship breakup, brooding rumination mediated the link between attachment anxiety and depressive symptoms. Although this study examined the mediational role of rumination in the link between attachment anxiety and depressive symptoms, it did
not investigate rumination as a potential mechanism to explain the link between attachment anxiety and anxiety symptoms.

The primary focus of the present study is to fill the gap in the research by examining the potential mediating role of rumination in the link between attachment anxiety and anxiety symptoms, as well as to replicate past research examining rumination as a mediator between attachment anxiety and depressive symptoms. The present study will focus specifically on brooding rumination as a mediator of the link between attachment anxiety and psychological distress (both depressive and anxiety symptoms). As mentioned, the Saffrey and Ehrenberg (2007) study only examined rumination as mediator in the context of relationship breakups. The present study will extend their work by examining the mediational role of rumination in general without limiting the sample exclusively to those who have been through a recent breakup. Since individuals high in attachment anxiety experience greater distress following a breakup (Saffrey & Ehrenberg, 2007) results from the previous study may not be generalizable to the general population.

Two main overarching mediational models will be evaluated in the present study. First, in order to replicate previous research, brooding rumination will be assessed as a mediator of the link between between attachment anxiety and depressive symptoms in adults. The second and third models will assess brooding rumination as a mediator of the link between attachment anxiety and two distinct types of anxiety: trait anxiety (a more stable and enduring personality characteristic) and state anxiety (momentary, situationally-based experiences of anxiety).
CHAPTER 2

LITERATURE REVIEW

The focus of the present study is an examination of the meditational role of rumination in the link between attachment anxiety and psychological distress (i.e., anxiety and depressive symptoms). The present chapter will begin with a review of the theoretical and empirical literature on attachment theory (Bowlby, 1982; 1988). This section will begin with a description of the fundamentals of attachment theory in infancy and childhood. Next, attachment will be described as it manifests across the lifespan. Different conceptualizations of adult attachment will be reviewed, with a particular focus on current conceptualization of attachment in terms of two dimensions: attachment anxiety and attachment avoidance (Brennan et al., 1998). Attachment anxiety is characterized with preoccupation with separation, abandonment, and insufficient love (Wei et al., 2003; Mallinckrodt & Wei, 2005; Vogel & Wei, 2005). Attachment avoidance is characterized with discomfort with intimacy, dependence, and emotional expressiveness (Brennan et al., 1998; Cassidy & Kobak, 1988; Hazan & Shaver, 1987; Mikulincer, Shaver, & Pereg, 2003). Next, research linking attachment avoidance and attachment anxiety to psychological distress will be reviewed. Within this review, specific types of distress will be discussed, namely depressive and anxiety symptoms. Lastly, mediators of attachment and psychological distress, including rumination, will be discussed.

The second section of the present chapter will provide an overview of response styles theory (RST; Nolen-Hoeksema, 1991), a theory explaining rumination style as a factor in the development and maintenance of depression (Nolen-Hoeksema, 1991;
Nolen-Hoeksema et al., 2008). Research on RST and rumination will be discussed next. Rumination and how it is linked to depression and anxiety will then be explained (Fritz, 1999; Harrington & Blankenship, 2002; Mor & Winquest, 2002; Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2008), followed by a description of the distinct ways to conceptualize rumination. Brooding, a type of rumination, will be explained in depth. The empirical literature on brooding as a mediator of attachment anxiety and anxiety and depression will be summarized. The final section of this chapter will address the gaps in this area of research, and how the present study will seek to fill some of these gaps. This chapter will conclude with the specific hypotheses associated with the present study.

**Attachment Theory**

Infants and children have the tendency to seek physical and mental contact from important caregivers. The attachment system is activated when a real or perceived threat is sensed in the environment and in times of distress (Bowlby, 1982). When the attachment system is activated, the way in which an infant’s attachment figure responds determines the development of an infant’s attachment to its caregiver. The attachment figure also serves as a “secure base” from which infants can explore their environment, for example to play with toys or crawl to another side of the room (Bowlby, 1982). Over time, attachment relationships develop between an infant and its caregiver as a means for the infant to receive protection and support during times of distress. Bowlby drew upon evolutionary theory as a way to explain that an infant’s survival is partly due its ability to seek proximity to its caregiver and obtain support. Specifically, the desire to maintain close proximity to one’s attachment figure could
help ensure survival if one were to find oneself in a dangerous situation and in need of protection (Bowlby, 1969, 1988).

**Attachment in Infancy and Childhood**

Mary Ainsworth, one of Bowlby’s colleagues, was also an important pioneer in attachment theory whose seminal work included empirically identifying secure and insecure patterns of attachment behavior in infants (Ainsworth, Blehar, Waters, & Wall, 1978). Ainsworth’s work included empirical support for the idea that the development of both secure and insecure attachment patterns in infants are directly related to the responsiveness of an infant’s primary caregiver in times of distress. Parental responsiveness to an infant’s needs is central to the development of secure attachment. In particular, if a parent provides a sense of safety and security through responsiveness to an infant’s needs, the infant is better able to explore its environment. The degree to which the caregiver welcomes an infant back when the infant needs comfort or reassurance, or is distressed or tired, influences the infant’s expectation that the caregiver can provide a safe haven. The extent to which the caregiver is unable to meet the infant’s needs for a secure base and safe haven will limit an infant’s exploration of its environment. The types of responses a caregiver provides over time contribute to an infant’s development of attachment as secure or insecure (Ainsworth, et al 1978).

Ainsworth developed a coding system called the Strange Situation Procedure (SSP; Ainsworth, 1967; Ainsworth, Blehar, Waters & Wall, 1978), which allowed for classification of secure and insecure attachment relationships. The procedure was used to activate infants’ attachment system through a series of separations (followed by
reunions) from their caregivers. The coding of the SSP is used to assess attachment style in infants and relies primarily, but not exclusively, on infant behavior during reunions. Through her observations of infant-mother dyads using the SSP, Ainsworth et al. identified three patterns of infant attachment: secure, insecure-avoidant and insecure-anxious.

**Characteristics of three attachment patterns.** Securely attached infants tend to be able to use their primary caregivers as a secure base from which they can explore their environment and be welcomed back. These infants are easily soothed during times of distress or when they are reunited with their caregiver after a separation. Caregivers of securely attached infants tend to be responsive to their infant’s exploration needs and are able to provide a safe haven to return to (Ainsworth et al., 1978).

Insecure-avoidant infants on the other hand do not typically seek support from their primary caregivers during times of distress. Additionally, these infants tend to explore their environments significantly less while they are separated from their primary caregiver. The caregiver behavior among these infant-caregiver dyads is often characterized by a lack of responsiveness to their infant’s needs (Ainsworth et al., 1978).

Infant behavior typical in insecure-anxious dyads tends to include exaggerated attachment behaviors such as clingingness and dependence. However, these infants often exhibit some resistance to support when their caregivers offer it. Caregiver behavior characteristic among these dyads can be inconsistent and intrusive (Ainsworth, 1967; Ainsworth et al., 1978).
Attachment over the lifespan: Internal working models of attachment.

According to Bowlby, attachment behavior is held to characterize human beings from “the cradle to the grave” (1979, p. 129). One way in which attachment is carried beyond infancy is through what are known as internal working models (Bowlby, 1988). Internal working models are representations developed in response to actual life experiences that individual has of him- or herself and others. One’s internal working models guide an individual’s perception of future events and experiences (Bowlby, 1982; 1988). Bowlby theorized that each of the three attachment patterns is accompanied by distinct internal working models.

Individuals with secure models have had experiences where their attachment figures have been responsive to their needs, and as a result, they have come to view themselves as worthy of care, and their attachment figure as reliable, dependable, and available to provide care. Individuals with insecure models (i.e., insecure-avoidant, insecure-anxious), on the other hand, tend to perceive themselves as unworthy of care and tend to expect attachment figures to be undependable and unreliable (Bowlby, 1962, 1988).

Although internal working models are developed in infancy, they are also observed in adulthood (Collins, Guichard, Ford, & Feeney, 2004). They are theorized to be one of the ways individuals carry similar patterns of attachment in infancy and childhood into adulthood (Bretherton & Munholland, 1999). Early evidence to support this theory was shown in a longitudinal study that was able to successfully assess the maintenance of internal working models over time in childhood (Main, Kaplan, & Cassidy, 1985). Studies have shown that once carried into adulthood,
internal working models may be difficult to change (Collins et al., 2004). However, an individual’s attachment can change if he or she has new experiences with attachment figures. For example, an adult’s attachment may change through having new experiences with romantic partners or through therapy (Bretherton & Munholland, 1999). This will be described in greater detail later.

**Stability of attachment.** There is a large body of empirical research supporting the stability of attachment over time. Several studies have provided support for stability of attachment by following infants into early childhood (Grossman & Grossman & Kindler, 2005; Banai, Weller, & Mikulincer, 1998). A meta-analytic review of five studies found moderate stability of attachment classification in infancy to early childhood (Fraley, 2002). Fraley (2002) conducted a meta-analytic review of 27 studies of infants, children, adolescents, and adults, and concluded that attachment was moderately stable across the lifespan. In total, over 30 published longitudinal studies have been conducted to assess the stability of attachment patterns in adulthood using a variety of measures of adult attachment (for a review, see Mikulincer & Shaver, 2007, p. 142, table 5.1). Among these, a meta-analysis of stability of attachment concluded that attachment is more stable when examined longitudinally in adulthood as compared to in childhood (Fraley & Brumbaugh, 2004).

In general, attachment is fairly stable. Nevertheless, longitudinal studies have shown that attachment can change when circumstances change (Sroufe & Egeland, 1991). For example, attachment can change through therapy if therapy allows for growth in an individual’s internal working models of attachment (Levy, Kelly,
Meehan, Reynoso, Clarkin, Kernberg, & Weber, 2006; Travis, Binder, Bliwise, & Horne-Moyer, 2001). Changes in attachment over time can also be explained by an individual’s attachment figure changing, which can happen as a child grows older (Ainsworth, 1991). Moreover, although in early life a child’s parents or other important caregivers may be the central attachment figures, as the child moves into adolescence he/she develops new attachment figures, such as romantic partners and important friends who provide needed support. Eventually spouses and partners become new primary attachment figures (Hazan & Shaver, 1987). This has been supported empirically in numerous studies (Mayseless, 2004; Fraley & Davis, 1997; Weiss, 1994, 1993).

Although attachment in adulthood has a similar function as it does in infancy and childhood, one should be aware of several distinctions between attachment in adulthood and attachment earlier in life. The first distinction is that infant/child-parent relationships are fairly asymmetrical, whereas adult couple relationships tend to be reciprocal (Weiss, 1982). Second, attachment observed in adults can look somewhat behaviorally different compared to those earlier in life (Hazan & Shaver, 1987; Mikulincer & Shaver, 2002a). Specifically, when an adult’s attachment system is activated by a real or perceived physical or psychological threat, the behavior of a secure adult is not necessarily characterized by physical proximity seeking as it is in securely attached infants. Adults may receive support from mental representations they have of their romantic partners or other attachment figures which can provide a sense of security and safety when an actual person is not available (Mikulincer & Shaver, 2004; Mikulincer & Shaver, 2007).
**Conceptualization of adult attachment.** The Adult Attachment Interview (AAI; George, Kaplan, & Main, 1986, 1996) was the first method devised to evaluate attachment styles in adulthood (Crowell, Waters, Treboux, & O'Connor, 1996). The Adult Attachment Interview is an interview that is recorded, transcribed, and coded to measure an individual’s general state of mind with regard to attachment (Hesse, 2008). An alternative conceptualization of adult attachment was developed in terms of adult romantic attachment in which romantic attachment was described as *pair bonds* between two adults, similar to the patterns observed in childhood (Fraley & Shaver, 2000). The conceptualization of attachment in adult romantic relationships was developed by applying Ainsworth’s ideas about infant attachment to attachment in adult relationships (Hazan & Shaver, 1987; Shaver & Hazan, 1993). Hazan & Shaver developed descriptions for the three attachment types (avoidant, secure, and anxious) for adult romantic attachment patterns (1987, 1993).

According to Hazan and Shaver’s (1987) three-category conceptualization of romantic attachment, securely attached adults are described as individuals who find it relatively easy to get close to their partners. Anxious adults tend to worry that their partners do not love or want to stay with them. These adults have been shown to want to remain overly close to their partners despite this behavior tending to alienate romantic partners. Avoidant adults on the other hand tend to feel uncomfortable with being close to their partners and they may find it difficult to fully trust or depend on others (Hazan & Shaver, 1987).

Later, a four-category model of adult attachment was developed by Bartholomew and Horowitz (1991). Building on the three categories provided by
Hazan and Shaver (1987), Bartholomew and Horowitz divided the avoidant group into two separate groups: fearful-avoidant and dismissing-avoidant. Bartholomew and Horowitz’s model included descriptions of four theoretical types of attachment including secure, fearful, preoccupied, and dismissing. In their model, secure individuals were described as those who find it easier to become emotionally close to others. These individuals were also characterized as being comfortable depending on other individuals and having others depend on them. Also, they typically do not fear being alone or having other people not accept them.

The preoccupied category is analogous to the anxious group in infancy. These are adults who are preoccupied with relationships and although they have the desire to be completely emotionally intimate with others, they often find that others are reluctant to get as close to them as they would like. Also, they experience discomfort when they are not involved in a close relationship. Further, when these individuals are in relationships they tend to worry others do not value them as much as they would like them to (Bartholomew, 1990).

Dismissing-avoidant adults are uncomfortable being in close emotional relationships and typically place value on being independent and self-sufficient. These adults prefer not to depend on others or have others depend on them. Fearful-avoidant adults also experience discomfort while getting close to others. However, they differ from dismissing-avoidant individuals because although they want to be emotionally close in their relationships they find it difficult to trust others completely or to depend on them. They also worry they will be hurt if they allow themselves to become too close to others (Bartholomew, 1990).
Currently, adult attachment is conceptualized in terms of two underlying dimensions known as attachment anxiety and attachment avoidance (Brennan et al., 1998), on the basis of a factors analysis of all the existing self-report measures of adult attachment. These dimensions of attachment can be used to understand the four groups identified by Bartholomew and Horowitz (1991). Fraley and Waller (1998) went on to find empirical support for this dimensional approach—as opposed to the categorical approach—as the way to best conceptualize attachment. Interestingly, Ainsworth and her colleagues also found evidence of two underlying dimensions of attachment when she conducted a discriminate analysis of the infant attachment categories, although she decided to focus on a categorical approach as heuristically more useful at the time (Ainsworth et al., 1978; Brennan et al., 1998; Fraley & Waller, 1998).

Although categories have historically been used to conceptualize attachment, dimensions of attachment are now considered to be the most valid approach for looking at adult romantic attachment (Fraley & Waller, 1998). Fraley and Waller empirically demonstrated that dimensions of attachment more closely match reality than do categories of attachment. Further, dimensions provide more precision and more power to detect effects when using a continuous measure.

Recent empirical work has often used a dimensional conceptualization of attachment whereas older work has used categorical conceptualizations more frequently. For the purposes of this paper, only dimensional language will be used and for the purposes of clarity and consistency, previous results based on categorical models will be translated into dimensional language. Attachment categories will be translated dimensionally as follows: those who are classified as secure are low in
attachment anxiety and low in attachment avoidance; those categorized as preoccupied are high in attachment anxiety and low in attachment avoidance; those in the dismissing-avoidant group are low in attachment anxiety and high in attachment avoidance; and individuals classified as fearful-avoidant are high in attachment anxiety and high in attachment avoidance (Mikulincer, Shaver, & Pereg, 2003).

**Definitions of attachment anxiety and attachment avoidance.** Attachment anxiety is defined in terms of an adult’s preoccupation with separation, abandonment, and insufficient love (Wei et al., 2003; Mallinckrodt & Wei, 2005; Vogel & Wei, 2005). Attachment anxiety is often accompanied by the fear that one’s attachment figure (e.g., romantic partner) will not be available to them during times of need (Brennan et al., 1998). Attachment avoidance, on the other hand, reflects the degree to which a person avoids intimacy, dependence, and emotional expressiveness (Brennan et al., 1998; Cassidy & Kobak, 1988; Hazan & Shaver, 1987; Mikulincer et al., 2003). Attachment avoidance is characterized by discomfort with closeness in relationships. Avoidance is often accompanied by an increased emotional distance from one’s partner (Brennan et al., 1998).

**Hyperactivating and deactivating strategies.** Attachment anxiety and attachment avoidance are characterized by hyperactivating and deactivating strategies of emotion regulation, respectively. A person’s attachment system may be hyperactivated or deactivated as a way to manage symptoms of distress and to get one’s attachment needs met when they are not met by an attachment figure (Cassidy & Kobak, 1988).

**Attachment anxiety: Hyperactivating strategies.** Attachment anxiety is
characterized by the use of hyperactivating strategies methods used by individuals to obtain support and minimize the distance between themselves and/or their partner. In the context of romantic relationships, hyperactivating strategies can include clingy and controlling responses to one’s partner and overdependence as ways to try to obtain support and a feeling of security (Cassidy & Kobak, 1988; Shaver & Hazan, 1993; Mikulincer & Shaver, 2003). They may also include hypervigilant attention to one’s physiological response to distress and can include rumination on perceived and actual threats (Main, 1990; Mikulincer & Shaver, 2007).

Hyperactivating strategies have been theorized to develop in infancy in response to having a caregiver who is inconsistent in his or her response to an infant’s needs (Mikulincer Shaver, & Pereg, 2003). As a result of these inconsistent responses, the infant’s attachment system may become hyperactivated (consciously or unconsciously) as a way to get its needs met and to manage feelings of distress (Fraley & Shaver, 1997).

**Attachment avoidance: Deactivating strategies.** Avoidance, on the other hand, is characterized by deactivating strategies. Deactivating strategies develop as a result of a caregiver’s rejection of closeness in the relationship and are used to manage symptoms of distress caused by unavailability of the attachment figure. These strategies may be used by an individual in response to a lack of availability of his or her caregiver. Deactivating strategies can include methods one uses to obtain distance from a thought or feeling of emotional distress (Birnbaum, Orr, Mikulincer, & Florian, 1997). Examples include denial of distress, distancing strategies, and avoidance of intimacy (Cassidy & Kobak, 1988).
Deactivating strategies have been theorized to develop in infancy in response
to having an attachment figure that is unavailable. After not having its needs met, an
infant may suppress its proximity seeking behavior and expression of needs and
vulnerabilities (Cassidy & Kobak, 1988; Main, 1990). Deactivating strategies can be
used to repress both positive and negative affect (Shaver & Mikulincer, 2002; Fraley
& Shaver, 1997). However, suppression of distressful thoughts or affect may not
always be conscious (Mikulincer & Shaver, 2007).

Adult romantic attachment is now conceptualized as a global aspect of one’s
personality that extends to all close adult relationships that may activate one’s
attachment system (Shaver & Mikulincer, 2005). The concept of global attachment is
that although romantic attachment dimensions obviously exist within romantic
relationships, they also exist in other close relationships. Multiple studies assessing
romantic attachment have shown that dimensions such as representations of self and
others, emotional regulation, and psychological defenses are related to non-romantic
relationships (Shaver & Mikulincer, 2002, 2003). These studies provide support for
the notion that adult romantic attachment reflects general tendencies within
interpersonal relationships when the attachment system is activated.

**Attachment avoidance and attachment anxiety and distress.** Bowlby (1973,
1988) initially proposed a link between attachment insecurity (high levels of
attachment anxiety or attachment avoidance, or high levels of both) and symptoms of
distress including depression and anxiety. Theoretically, insecure attachment is linked
to increased distress for several reasons. Insecurely attached individuals develop poor
models of themselves and others and as a result may have lower self-esteem and more
negative expectations of others. Consequently, individuals who are insecure may not see themselves as deserving to have their needs met and may not view others as trustworthy to respond sensitively when needed.

There is a large body of research supporting the link between both attachment anxiety and attachment avoidance and greater psychological distress (for a review see Fuendeling, 1998; Mallinckrodt & Wei, 2005; Vogel & Wei, 2005). Both anxiety and depression have been empirically linked to attachment across numerous studies (Fuendeling, 1998). Specifically, attachment anxiety has been shown to be associated with increased depressive and anxious symptoms in hundreds of studies in the past several decades (Mikulincer & Shaver, 2007; Mallinckrodt & Wei, 2005; Wei et al., 2003; Vogel & Wei, 2005). There is also a body of research providing support for the relationship between attachment avoidance and depressive and anxiety symptoms (Mikulincer & Shaver, 2007; Mallinckrodt & Wei, 2005; Wei et al., 2003). However, the findings are less consistent than those found among studies of attachment anxiety (Lopez, Mitchell, & Gormley, 2002.) The aforementioned studies include those examining mediators of the link between attachment and psychological distress. Those studies examining mediational models relevant to the current study will be discussed next.

**Mediators of the link between attachment and distress.** There has been substantial empirical research on factors that mediate the link between attachment and distress. Mediators of the link between attachment and distress have included the following: coping (Wei et al., 2003); psychological needs (Wei et al., 2005); social competencies
(Mallinckrodt & Wei, 2005); social support (Mallinckrodt & Wei, 2005; Larose & Bernier, 2001); perfectionism (Wei, Heppner, Russell, & Young, 2006); and an inability to communicate emotions (Wei et al., 2006; Mallinckrodt & Wei, 2005). Although there are some common mediators between attachment avoidance and attachment anxiety and distress, there are also differences. Common mediators found when examining both attachment anxiety and attachment avoidance include low social self-efficacy and level of emotional awareness (Wei & Mallinckrodt, 2005). Mediators of the link between attachment anxiety, specifically, and distress have included emotion regulation, perceived coping and basic psychological needs satisfaction (Wei et al., 2003; Wei, Young, Zahalik, 2005). Mediators of the link between attachment avoidance, specifically, and distress have included distancing coping strategies, cognitive disengagement, and suppression of emotional material (Lazarus & Folkman, 1984; Shapiro & Levendosky, 1999).

**Differences in thinking between attachment avoidance and attachment anxiety.** An explanation of the differences in the mediators of the dimensions of attachment versus those of distress may partially be explained by the different cognitive and affective strategies used to manage attachment-related experiences by those high in either attachment anxiety or attachment avoidance. Some researchers suggest that the differences in patterns of cognition and affect which are common among individuals high in attachment anxiety compared to individuals high in attachment avoidance are related to the differences in use of hyperactivating and deactivation strategies (Bowlby, 1969; Creasey & Hesson-McInnis, 2001; Mikulincer & Orbach, 1995). For example, those high on attachment avoidance may tend to use
deactivating strategies that distance the individual from unpleasant affect. Attachment anxiety and hyperactivation on the other hand may be characterized by preoccupation or repetitive thinking (Mikulincer & Shaver, 2003).

**Rumination as a mediator of attachment anxiety and distress (anxiety and depression).** One factor that has been examined as a mediator of the link between attachment and distress is rumination. Rumination is defined as “a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and the possible causes and consequences of these symptoms” (Wisco et al., 2008).

**Attachment and rumination.** Insecure attachment in adults has been linked to increased rumination. Studies examining attachment anxiety in adults found that attachment anxiety was related to increased rumination (Collins et al., 2006; Saffrey & Ehrenberg, 2007). This may be the case because adults high in attachment anxiety may be more likely to ruminate because of their tendency to use hyperactivating strategies. The repetition and anxiety associated with some types of rumination makes it consistent with the use of hyperactivating strategies. Individuals high in attachment anxiety may also ruminate as a result of insecure working models established earlier in life (Collins et al., 2006; Saffrey & Ehrenberg, 2007). There is also some evidence suggesting that rumination is a form of coping among individuals high in attachment anxiety (Mikulincer & Shaver, 2007, p. 202). Attachment avoidance, on the other hand, has not been linked to increased rumination empirically (McWilliams & Holmberg, 2010). This is not surprising given that individuals high in attachment avoidance are more likely to engage in distraction-oriented coping techniques characteristic of deactivating strategies than in hyperactivating techniques (Birnbaum,
Studies examining rumination in individuals high in attachment anxiety have identified specific contexts in which rumination is likely to occur, and specific thought content these individuals tend to ruminate on. For example, rumination among individuals high in attachment anxiety has been shown to occur in response to reactions of romantic partners. Individuals high in attachment anxiety may experience greater rumination due to applying negative attributions to one’s partner’s behavior (Collins et al., 2006). Rumination has also been shown to occur among individuals high in attachment anxiety in the context of social interactions. Specifically, individuals high in attachment anxiety may ruminate more often about social interactions than individuals low in attachment anxiety, and the content of that rumination can be both general as well as specifically about their behavior in social situations (Mikulincer & Shaver, 2007). Rumination is suspected to occur in such cases partly because of the ambivalence and inhibition associated with approach tendencies towards partners because of an underlying fear of rejection (Mikulincer & Shaver, 2007). Adults high in attachment anxiety have also been found to ruminate about rejection (Baldwin & Meunier, 1999; Baldwin & Kay, 2003).

**Rumination and distress.** A large body of research has supported the link between rumination and psychological distress. These studies have taken various approaches to conceptualizing rumination, but across a spectrum of conceptual approaches rumination has been linked to various forms of psychological distress (Beck & Emery, 1985; Clark & Wells, 1995; Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008; Saffrey & Ehrenberg, 2007). Much of the research on
rumination has focused on RST, a theory describing rumination style as a key factor in the development and maintenance of depression (Nolen-Hoeksema, 1991).

**Response Style Theory**

Response styles theory is a theory of depression developed by Nolen-Hoeksema (1991). The theory suggests that styles of rumination and use of distraction strategies impact the development and maintenance of depressive symptoms. RST includes two major categories of response styles: *distraction* and *rumination*. Briefly, distraction is a coping mechanism that helps individuals to distract themselves from negative thoughts (Nolen-Hoeksema, 1991). Distraction may have adaptive qualities because individuals can use it as a way to shift one’s focus away from depressive thoughts they are experiencing. In one review of the empirical literature on distraction and rumination, Nolen-Hoeksema and colleagues (2008) concluded that the use of distraction in experimental studies acted as a coping strategy and was linked to a decrease in depressed mood. However, the authors concluded that the findings were mixed and distraction was not always linked to a decrease in depressed mood. Rumination, on the other hand, was positively related to depressive symptoms. Therefore, the focus of the present study will be on the rumination aspect of RST.

Nolen-Hoeksema and colleagues (2008) defined rumination as “a mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and the possible causes and consequences of these symptoms” (p. 400). More simply described, rumination is said to be the tendency to think constantly about one’s feelings and problems (Nolen-Hoeksema et al., 2008). Nolen-Hoeksema (1991,
2003) further describes rumination as a way some individuals focus their attention on depressive symptoms they are experiencing and on what they think will happen as a result of those symptoms. Not surprisingly, rumination has been consistently linked to psychological distress including depression and anxiety. These findings will be summarized.

**Rumination and Its Link to Depression and Anxiety**

According to RST, rumination is linked to depression and anxiety for multiple reasons. First, individuals who ruminate will often focus on negative thoughts and feelings related to their depressed mood (Nolen-Hoeksema, 1998; Nolen-Hoeksema, et al., 2008). Rumination also is linked to depression and anxiety by exacerbating and maintaining symptoms by enhancing negative thinking, interfering with one’s instrumental behavior, weakening problem solving abilities, and impacting one’s social support (Nolen-Hoeksema, 1991; Nolen-Hoeksema et.al., 2008).

Prior research has supported RST through findings that rumination is linked to increased psychological distress including depression and depressive disorders (Nolen-Hoeksema et al., 2008; Mor & Winquest, 2002. For reviews see Nolen-Hoeksema, 2000; Just & Alloy, 1997). Among these studies some researchers have relied upon the use of self-report measures of rumination (Just & Alloy, 1997; Kuehner & Weber, 1999; Siegel et.al., 2004), whereas others have used experimental designs to induce rumination in participants (Lyubomirsky, Caldwell, Nolen-Hoeksema, 1998; Nolen-Hoeksema & Marrow, 1993).

Although RST initially focused on depression, researchers have also conducted
studies examining rumination and how it relates to anxiety. These studies have supported the link between rumination and anxiety and have also relied primarily on the use of self-report measures and rumination induction methods (Abbott & Rapee, 2004; Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Fritz, 1999; Harrington & Blankenship, 2002; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, 2000; Muris et al., 2005; Segerstrom et al., 2000). Studies of the link between rumination and anxiety have also included those who followed participants longitudinally (Beck & Emery, 1985; Clark & Wells, 1995).

**Conceptualization of rumination.** Although rumination in general has been discussed as it relates to depressive and anxiety symptoms, the next section will focus on a specific form of rumination known as brooding. First, in order to provide a better understanding of brooding rumination, it is necessary to understand the development of prior measures of rumination. The Response Styles Questionnaire (RSQ) was developed by Nolen-Hoeksema and Morrow (1991) in order to facilitate their research on RST. The RSQ was a measure of response styles and captured rumination and distraction in addition to several additional subscales unrelated to rumination or distraction. The RSQ was used in response styles research in many studies (for a review see Nolen-Hoeksema et al., 2008). However, there was some concern that there may be overlap between items that captured rumination and items that captured depressive symptoms (Treynor et al., 2003). As a result, Treynor, Gonzalez and Nolen-Hoeksema conducted a study using a factor analysis to address their concerns about overlap of rumination items with depressive items; this factor analysis suggested that there were three underlying factors, including one factor related to depressive symptoms. The
items reflecting depressive symptoms were removed in order to develop a measure that focused specifically on the construct of rumination. The factor analysis also yielded two rumination factors: brooding and reflection (Treynor, Gonzalez, & Nolen-Hoeksema, 2003). This was an important turn in the research since the factor analysis yielded two specific types of rumination that relate to distress differently (Conway, Csank, Holm, & Blake, 2000).

*Reflection* is a style of rumination that is adaptive and can serve as a coping strategy by helping individuals to solve their problems. *Brooding* on the other hand is a type of rumination that tends to focus on negative content related to symptoms of depression (Nolen-Hoeksema et al., 2008). Brooding has been found to be more maladaptive than adaptive. Although reflection will be discussed briefly, brooding will be the focus of the present study due to its maladaptive nature and association with distress.

**Definition of reflection.** Reflection was described by Treynor et al. as neutral in valence and capturing rumination in the way that the *Webster New Collegiate Dictionary* does: “to engage in contemplation: to reflect, to ponder” (Treynor et al., 2003; Woolf, p. 1004, 1981). Further, reflection is characterized as a self-reflective tendency which is more general in nature and can include using an adaptive problem solving approach to one’s problems (Treynor et al., 2003; Miranda & Nolen-Hoeksema, 2007; Nolen-Hoeksema et al., 2008).

**Adaptive qualities of reflection.** Due partly to the limited research on reflection, the adaptive qualities of reflection are not completely understood and research findings of studies have been mixed. In one study there was an initial
positive relationship between reflection and depression, but reflection was negatively
correlated with depression after a year. These results may suggest that although
reflection can be an adaptive form of rumination, those effects may take time to be
seen (Treynor et al., 2003). Other studies have found reflection to be associated with
less negative adjustment compared to brooding rumination (Treynor et al., 2003;
Saffrey & Ehrenberg, 2007). Some researchers have concluded that reflection may be
more adaptive because the thought content associated with reflection may be more
positive in nature (i.e., related to problem solving; Haigh, Armey, Fresco, Auerback,
& Abela, 2004). Brooding, on the other hand, tends to capture more negative thought
content (Treynor et al., 2003).

**Definition of brooding.** Treynor et al. referred to the Webster dictionary’s
definition of brooding which is “moody pondering” (Woolf, p. 1004, 1981). They
elaborated by explaining that brooding captures a type of rumination that tends to
include thought content that is negative and related to one’s depressed mood
(Treynor et al., 2003). Whereas reflection may include problem solving, brooding
tends to include focusing on the obstacles in the way of overcoming one’s problems.

**Brooding and depression.** As is the case with some certain forms of
rumination, brooding rumination is associated with increased distress (e.g., depression,
anxiety). Brooding is linked to distress largely as result of its negative thought content
and emphasis on negative types of self-reflection (Treynor et al., 2003).

An individual who is likely to brood may be at prolonged risk to develop
depressive symptoms (Just & Alloy, 1997; Kuehner & Weber, 1999). Prior research
has supported the link between brooding and depression (Joormann, Dkane, & Gotlib,
2006; Nolen-Hoeksema et al., 2008). For example, brooding was found to relate to depressive symptoms both longitudinally as well as concurrently (Treynor et al., 2003). The results of another study indicated that scores on brooding were higher among participants with a diagnosis of current major depression compared to participants diagnosed with a mental illness unrelated to depression (Joormann, Dkane, & Gotlib, 2006). Saffrey and Ehrenberg (2007) found that individuals who brood have greater distress following a break-up with a partner.

**Brooding and anxiety.** As was the case with other forms of rumination and anxiety, studies have also shown that brooding rumination is related to increased anxiety (Nolen-Hoeksema, 2000; Segerstrom, Tsao, Alden, & Craske, 2000). Brooding was linked to anxiety in a study of 271 undergraduate college students (Raes, 2010). When brooding was examined in a sample of depressed individuals, it was also shown to be related to increased anxiety (Roelofs, Huibers, Peeters, Arntz, & Van Os, 2008). In another study, which included participants diagnosed with social phobia, participants received higher scores on measures of brooding when compared to control participants (Joormann et al., 2006).

**Brooding rumination and attachment avoidance and attachment anxiety.** As stated earlier, it is logical to expect that individuals high on attachment avoidance will not be high on brooding because of their tendency to use deactivating strategies rather than hyperactivating strategies (e.g., rumination). Interestingly, individuals high in attachment avoidance have been found to use more distraction based strategies as a way to cope with distress (Birnbaum et al., 1997). Individuals high in attachment anxiety, on the other hand, who are likely to engage in hyperactivating
strategies, have been shown to receive higher scores on measures of brooding (Saffrey & Ehrenberg, 2007).

**Brooding rumination as a mediator of attachment anxiety and depressive symptoms.** Saffrey and Ehrenberg (2007) looked at rumination as a mediator between attachment anxiety and negative adjustment. Although the term “negative adjustment” was used, the authors measured adjustment using a general measure of distress. The measure captured depressive symptoms. Both brooding and reflection were each examined in a sample of adults who had recently experienced a romantic relationship break-up. Findings indicated that brooding was associated with higher depressive symptoms. The authors predicted and found that individuals who were high in attachment anxiety brooded more often than those low in attachment anxiety, specifically about the behaviors of one’s partner. Finally, brooding was shown to partially mediate the relationship between attachment anxiety and depressive symptoms.

**Extension of Previous Research**

The results of the Saffrey and Ehrenberg (2007) study are promising in providing support that rumination mediates the link between attachment anxiety and depressive symptoms. However, several gaps in the research remain. The authors themselves also discussed limitations of their study. These will be discussed, followed by a review of the ways that the present study seeks to address some of the gaps and limitations.

Participants in the study by Saffrey and Ehrenberg (2007) consisted exclusively of college students who had recently been through a romantic break-up. Although
romantic attachment was assessed, participants were asked to answer questions specific to their most recent romantic partner. As a result, the generalizability of the study’s findings to populations who have not been through a recent romantic break-up is limited. Future research should include a wider sample as a way to make the results more generalizable to the other populations. It is also unclear whether or not measures of distress and rumination may have been impacted by participants’ recent break-up.

While reviewing the limitations of their study, Saffrey and Ehrenberg (2007) discussed the limited psychometric properties of the measure of brooding rumination they used. Brooding rumination was assessed using the General Rumination Scale (GRS; Saffrey & Ehrenberg, 2007), a measure that does not have established validity or reliability. Future research examining brooding should include a measure with established psychometric properties. Future research should also replicate the study by assessing depressive symptoms. Given previous research on the links between attachment anxiety and rumination, attachment anxiety and anxiety symptoms, and rumination and anxiety symptoms, anxiety symptoms should be included in future investigations.

In studies of rumination, findings have indicated that rumination is a fairly stable trait (Bagby, Rector, Bacchiochi, & McBride, 2004; Kuehner & Weber, 1999; Nolen-Hoeksema & Davis, 1999). Since rumination has been shown to increase depression and anxiety, it is important to develop effective therapeutic interventions to decrease rumination. Cognitive behavioral therapy interventions have already shown some success in reducing rumination (Beck, Rush, Shaw, & Emery, 1979).

Before the present study’s hypotheses are reviewed, several complexities will be
discussed. First, the rationale for choosing to not examine reflection as a mediator of 
rumination and decreased symptoms of distress in the present study will be discussed. 
Although research on the adaptive qualities of reflection is promising, this area of 
research has been mixed (Nolen-Hoeksema et al., 2008). Although reflection was 
negatively linked to depression over time, it was positively linked to depression 
initially (Treynor et al., 2003). Thus, because reflection can be associated with either 
lower or higher levels of depression, no specific hypotheses about reflection were 
advanced.

Distraction is an important part of RST and has been linked to distress in prior 
research. In general, distraction has been shown to be adaptive in decreasing 
symptoms of distress. However, the results of studies of distraction are mixed. In 
general, it is a more adaptive quality. Although individuals high in attachment 
avoidance may use distraction techniques, distraction will not be examined in this 
context in the present investigation. Since attachment avoidance is not an adaptive 
quality, one would not expect individuals high in attachment avoidance to be using 
distraction as it is conceptualized in RST. Therefore, the present study does not have 
any specific hypotheses about attachment avoidance or distraction.

Next, investigating these questions among women exclusively may be beneficial 
for several reasons. Women have been shown to experience higher rates of depression 
compared to men (Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Nolen-Hoeksema, 2001). Similarly, gender differences have been found in studies of anxiety 
indicating higher rates of anxiety among women than men (Robins & Regier, 1991). 
Also, women are more likely to engage in rumination than men according to previous
research (Grant et al., 2004; Nolen-Hoeksema & Larson, 1999; Roberts et al., 1998; Grant et al., 2004; Ziegart & Kistner, 2002; Nolen-Hoeksema, 2000). Further, research on rumination and depression has shown that gender differences in rumination mediated the gender difference in depression (Nolen-Hoeksema et al., 1994, 1999; Roberts et al., 1998).

Differences among men and women in terms of adult romantic attachment also exist. A metanalytic review of gender differences in romantic attachment looked at the dimensions of avoidance and anxiety and found that men tended to score higher on attachment avoidance than females and females scored higher on attachment anxiety than males (Del Giudice, 2003). Also interesting is that these gender differences in attachment anxiety have been shown to be highest during young adulthood (Del Giudice, 2003). Lastly, homogenizing the sample by including female participants only may help to detect effects.

The Present Study

The present study will seek to replicate Saffrey and Ehrenberg’s (2007) findings by examining the mediational role of rumination in the link between attachment anxiety and depressive symptoms. The present study will also extend the research previously described in several ways. As previously mentioned, participants in the Saffrey and Ehrenberg study had been through a recent relationship break-up. In the current investigation, the mediational role of rumination in the link between attachment anxiety and distress will be examined in a general context, rather than within the specific context of a recent relationship break-up. In this way, romantic attachment will be assessed more generally.
Although Saffrey and Ehrenberg (2007) examined rumination as a mediator of the link between attachment anxiety and distress in general, they did not examine anxiety symptoms as a specific outcome. The proposed study will seek to extend previous research by investigating rumination as a mediator of the link between attachment anxiety and anxiety symptoms. Two distinct forms of anxiety will be assessed: A general and long standing type of anxiety known as trait anxiety and a present level of anxiety known as state anxiety (Spielberger, 1983).

The present study will also use a measure of rumination that will help to extend the findings of Saffrey and Ehrenberg (2007). The measure of rumination was created by the authors for that particular study and it did not have established psychometric properties. In the present investigation a measure of rumination that has been used in multiple studies and has been shown to be psychometrically sound. Two main mediational models will be evaluated in the present study. First, in order to replicate previous research, brooding rumination will be hypothesized as a partial mediator of the relation between attachment anxiety and depressive symptoms. The Baron and Kenny (1986) method of testing mediation will be used to test each model and its sub-hypotheses. Baron and Kenny require four steps and four regressions to establish mediation. The second main model contains two separate sub-models that will examine brooding rumination as a mediator of attachment anxiety and anxiety. In the first sub-model brooding rumination is hypothesized as a partial mediator between attachment anxiety and trait anxiety symptoms. In the second sub-hypothesis brooding rumination is hypothesized as a partial mediator between attachment anxiety and state anxiety symptoms.
Figure 1.

*Model 1: Rumination as a Mediator of Attachment Anxiety and Depressive symptoms*

Specific sub- hypotheses:

1. There will be a direct relation between attachment anxiety and depressive symptoms.

2. There will be a direct relation between attachment anxiety and brooding rumination.

3. There will be a direct relation between brooding rumination and depressive symptoms.

4. Brooding rumination will mediate the relationship between attachment anxiety and depressive symptoms.
Figure 2

*Model 2: Rumination as a Mediator of Attachment Anxiety and Trait Anxiety*

**Specific sub-hypotheses:**

1. There will be a direct relation between attachment anxiety and trait anxiety symptoms.

2. There will be a direct relation between attachment anxiety and brooding rumination.

3. There will be a direct relation between brooding rumination and trait anxiety symptoms.

4. Brooding rumination will mediate the relationship between attachment anxiety and trait anxiety symptoms.
Figure 3

*Model 3: Rumination as a Mediator of Attachment Anxiety and State Anxiety*

Specific sub-hypotheses

1. There will be a direct relation between attachment anxiety and state anxiety symptoms.

2. There will be a direct relation between attachment anxiety and brooding rumination.

3. There will be a direct relation between brooding rumination and state anxiety symptoms.

4. Brooding rumination will mediate the relationship between attachment anxiety and state anxiety symptoms.
CHAPTER 3

METHODS

Participants

An a priori power analysis was conducted to determine the sample size needed to achieve adequate power with a small-to-medium effect size (i.e., \( R^2 = .09 \)). In order to control for study-wise Type I error, \( \alpha \) was adjusted to account for the fact that two overarching mediational models were tested. The power analysis yielded that 120 participants were needed in order to achieve a power of .80 with two predictors and \( \alpha = .025 \). An online calculator (Soper, 2012; http://www.danielsoper.com/statcalc/calc01.aspx) was used to calculate sample size.

A convenience sample of undergraduate and graduate level students enrolled at three universities was recruited for the study. Two of the universities were in the northeast region of the United States and the third university was in a southern urban city in the United States. Female participants between the ages of 18-30 years old were recruited from listserves for students enrolled in courses associated with several departments. As expected, based on the composition of students enrolled at the universities, the majority of the sample was Caucasian. The age range of participants was 18-30 with an average age of 22. A large percentage (82.9\%) of participants identified themselves as White/European American, 9\% as Black/African American, 5.7\% as Asian American/Pacific Islander, 5.7\% as Hispanic/Latino/a, 2.4\% as Chinese, 1\% as American Indian or Alaskan Native and 4.8\% as race not listed. Race, sexual orientation, religious/spiritual denomination/affiliation and years in school of participants are summarized in tables 4, 5, 6 and 7 respectively. Sexual orientation
reported by participants was .8% gay, 2.4% lesbian, 4.9% bisexual, .8% queer, 87.8% heterosexual, 2.4% were not sure or didn’t know, and .8% reported “other.” Religious and spiritual denomination and affiliation of participants included 61% Christian, 4.9% Jewish, .8% Muslim, .8% Buddhist, 4.9% spiritual/non-religious, 12.2% agnostic, 5.7% atheist and 9.8% reported “other.” Participants received a $5 amazon.com gift certificate for their participation.

Measures

The Experiences in Close Relationships Scale- Short Form (ECR-S; Wei, Russell, Mallinckrodt & Vogel, 2007) is a 12-item short version of the Experiences in Close Relationships Scale (ECR; Brennan, Clark, & Shaver, 1998). Brennan, Clark, and Shaver (1998) created the original ECR through a factor analysis of all extant measures of adult attachment and found that there were two dimensions: anxiety and avoidance. The ECR includes an Anxiety subscale (18 items) and an Avoidance subscale (18 items). The Anxiety subscale assesses the respondent’s degree of preoccupation with close relationships and a strong desire for closeness. The Avoidance subscale assessed the respondent’s level of discomfort with closeness and interdependence (Brennan et al., 1998). Internal consistency estimates reported were .91 for the anxiety subscale and .94 for the Avoidance subscale (Brennan et al., 1998). Test-retest reliability of the original ECR form was established by administering the measure to undergraduates and then a second time three weeks later. Test-retest reliabilities were .70 for both the anxiety and avoidance subscales (Brennan, Shaver, & Clark, 2000). Test-retest reliability coefficients of .68 and .71 were found for anxiety and avoidance, respectively, over a six-month period (Lopez & Gormley, 2002). Evidence for the validity for the original 36-item version of the ECR was provided
through theoretically expected correlations with emotions, touch, and sexual practices (Brennan et al., 1998).

The short version of the ECR was developed by Wei, Russell, Mallinckrodt and Vogel (2007). The ECR-S contains a total of 12 items, including a 6-item anxiety scale and a 6-item avoidance scale. The instructions ask respondents to rate the degree to which each item describes their typical feelings in romantic relationships. Participants are instructed to respond to items in terms of how they experience relationships in general as opposed to within a specific relationship. Respondents answer using a 7-point, partly anchored Likert-type scale: 1 \textit{(disagree strongly)}, 4 \textit{(neutral/mixed)}, 7 \textit{(agree strongly)}. A high score on the Anxiety subscale is indicative of higher levels of attachment anxiety for the respondent. Examples of items in the anxiety subscale of the ECR-S include the following statements: “I worry about being abandoned,” “I worry a lot about my relationships,” and “I worry romantic partners won’t care about me as much as I care about them” (Wei et al., 2007). Both the Anxiety and the Avoidance subscales were administered, but for the purposes of the present study only the Anxiety subscale was included in analyses, as planned.

The short version of the ECR was developed by selecting items from the ECR using both rational and empirical methods and by examining descriptions of adult attachment anxiety and avoidance constructs (Brennan et al., 1998; Mikulincer et al., 2003). The factor structure of the short version of the ECR was compared to the original version of the ECR in a college sample across six studies (Wei et al., 2007). Confirmatory factor analysis showed that Anxiety and Avoidance fit the data relatively well for both the original and short versions of the ECR across studies. Construct
validity of Attachment Anxiety in the short version of the ECR was established by the theoretically-expected positive association found between attachment anxiety and excessive reassurance seeking and emotional reactivity (Wei et al., 2007). Results of the six studies by Wei et al. included support for the construct validity of Attachment Avoidance in terms of positive associations with emotional cut off and negative associations with comfort with self-disclosure and fear of intimacy. Wei et al. reported that the six studies showed that the construct validity coefficients for Attachment Anxiety and Attachment Avoidance were equivalent for both the original ECR and the short version of the ECR. Internal consistency reliability estimates were .78 (anxiety) and .84 (avoidance) for the ECR-S.

The Ruminative Response Scale (RRS, Nolen-Hoeksema & Morrow, 1991) is a self-report measure of rumination. The RRS was initially developed as a 22-item rumination subscale of the Response Styles Questionnaire, a measure of response styles. The original RRS has been reported to have both acceptable internal consistency and adequate convergent validity (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991) and has been used in multiple studies (for review see Nolen-Hoeksema et al., 2008). However, there was some concern that items on the RRS overlapped with the construct of depression. In order to avoid confounding items with depression, Treynor et al. (2003) identified and removed the twelve items that overlapped with depression based on item similarity to those on the Beck Depression Inventory (Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961). Treynor et al. analyzed the remaining 10 items using a principal component analysis which showed
two distinct factors: *Brooding* and *Reflection*.

Five items captured *Brooding*. The construct brooding was defined by Treynor et al as “moody pondering.” The definition is consistent with prior definitions of brooding (Woolf, 1981). Brooding captured negative aspects of rumination (Nolen-Hoeksema, 2008). Reflection consisted of five items and these were described as neutral in valence. The authors emphasized the importance of making the distinction between brooding and reflection since brooding is related to depressive symptoms both longitudinally and concurrently and reflection represents more adaptive qualities. For example, reflection often includes problem solving (Treynor et al., 2003). For the purposes of the present study only the Brooding subscale was used because of its relation to psychological distress (Treynor et al., 2003).

The instructions for the RRS are as follows: “People think and do many different things when they feel sad, blue, or depressed. I’m going to read a list of possibilities. Turn to the next scale in your book and please tell me if you never, sometimes, often, or always think or do each one when you feel down, sad, or depressed. After reading the following statements, please indicate what you generally do, not what you think you should do” (Treynor et al., 2003). Respondents are asked to rate the extent to which they believe each item reflects their own thoughts on a scale of 1 (*almost never*) to 4 (*almost always*). The RRS contains subscales of Reflection and Brooding. The Brooding subscale was included in the present study. *Brooding* captures rumination associated with negative thought content related to symptoms of depression (Treynor, et al., 2003). An example of an item on the brooding scale is “Think, “What am I doing to deserve this?” or “Think, why do I always react this way?”
Reliability for the Brooding subscale was also examined by Treynor and colleagues (2003). The coefficient alpha was .77 at Time 1 and the test-retest correlation was $r = .62$. Brooding is expected to be theoretically associated with depression (Wisco et al., 2008). The validity of the Brooding subscale was supported with strong associations with concurrent depression and after one year (Treynor et al., 2003).

The Center for Epidemiological Studies Depression Scale (CES-D; NIMH; Radloff, 1977) was used to assess depressive symptoms. This instrument contains 20 items measuring respondents’ depressive symptoms. Respondents are asked to rate how often they have felt a particular way during the past week. The scale ranges from 0 (rarely or none of the time) to 3 (most or all of the time). An example of an item is, “I was bothered by things that usually don’t bother me.”

There are six sub-scales reflecting different dimensions of depression: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. Scores on subscales are summed to give a total score on depressive symptoms. Higher scores reflect higher levels of depressive symptoms. A score of 16 or above is considered the clinical cut-off point for depression (Radloff, 1977).

The scale was developed by selecting items from several self-report measures of depression that had been previously validated (see Radloff, 1977 for a comprehensive list). Twenty items were selected to represent various aspects of depression and were administered to clinical and non-clinical samples. Evidence for construct validity was obtained by comparing the items to other validated
self-report measures of depression and negative affect (Radloff, 1977 for list), and construct validity was also supported by positive correlations between the CES-D and clinical ratings of depression. In addition, more recent studies have also found CES-D to be correlated with negative affect (Sheehan, Fifield, Reisine & Tennen, 1995), depressive affect, somatic symptoms, and interpersonal difficulties (Knight, Williams, McGee & Olaman, 1997).

Radloff (1977) demonstrated that the CES-D has adequate reliability and reported internal consistency for the measure with Cronbach’s alpha coefficients ranging from .85 to .90. Also, test-retest reliability was assessed by having participants complete and return the CES-D 2, 4, 6, or 8 weeks after Time 1. The authors reported test-retest reliability to be adequate with coefficient alphas at .80 or above.

The State-Trait Anxiety Inventory (Spielberger, et al., 1983) is a 40-item self-report measure of anxiety in adults. There are two subscales (20-items each) which assess two distinct forms of anxiety; state anxiety and trait anxiety.

The State Trait Anxiety Inventory-Trait (STAI-Trait; Spielberger, et al.,1983) is a 20-item measure of Trait Anxiety symptoms in adults. The STAI-Trait assesses a general and long standing type of anxiety referred to as Trait anxiety. The scale will be used to assess respondent’s general feeling of anxiety. A sample item is “I am a steady person.” Instructions for the STAI-Trait ask respondents to read statements and rate the degree to which they agree with a statement using a 4-point scale from 1 (almost never) to 4 (almost always.) Evidence for reliability for the STAI-Trait was provided by Spielberger et al., who reported internal consistency to be high ranging from .80 to .90. Test-retest reliability was in the high .70’s. More recently, Barnes, Harp
and Jung (2002) reported reliability to be adequate with a test-retest average of $r = .88$ for studies administering the test at multiple time intervals.

The State-Trait Anxiety Inventory-State (STAI-State; Spielberger, et al., 1983) is a 20-item measure of State Anxiety in adults. The STAI-State assesses respondent’s state anxiety (also known as present level anxiety.) Instructions for the STAI-State ask respondents to rate themselves on each item on the basis of a 4-point Likert scale, ranging from 1 (not at all) to 4 (very much so). The instructions ask individuals to respond to items based on how they feel “right now, at this moment.” Sample items include “I feel strained” and “I am worried.” Barnes, Harp and Jung (2002) reported temporal stability (average $r = .70$). Spielberger (1983) reported a .92 median Cronbach alpha coefficient. Evidence for concurrent validity includes theoretically-expected correlations between the STAI-State and the Taylor Manifest Anxiety Scale (Taylor, 1953), as well as with the Institute for Personality and Ability Testing (IPAT) Anxiety Scale (Cattell & Scheier, 1963).

**Procedure**

Participants were recruited from multiple undergraduate and graduate list serves associated with courses in several departments. Students were informed that their consent was voluntary and that there would be no negative consequences for refusing to participate. Undergraduate and graduate students were recruited from Boston College, Penn State University, and the University of New Orleans. The primary investigator requested that the instructors of undergraduate and graduate student courses in the Psychology, History and Religious Studies, College of Communications, Sociology and Crime, Law and Justice and the Counseling
Psychology and Rehabilitation Services and Counselor Education programs at Penn State University send out a recruitment email through a listerve associated with their courses. Instructors of undergraduate and graduate student courses at Boston College and Penn State University sent out the primary investigator’s recruitment email through their class course listserves. At the University of New Orleans, instructors of undergraduate courses in the psychology department posted the email recruitment letter on the student’s course “moodle space.” Moodle space is an open source course management system, also known as a learning management system or a virtual learning environment.

Permissions from the IRB offices at each university were granted to the primary investigator prior to data collection. The recruitment email contained the recruitment details including risks and benefits of participants as well as compensation. Email recruitment occurred during the Summer 2011 academic semester and contained a link to psycdata.com, where the informed consent and questionnaires were found. The informed consent emphasized that student participation was completely voluntary, and that they would not be penalized for not participating.

To protect participant privacy, the primary investigator was unable to match the data with names of participants. However, upon completion of the questionnaires participants were asked to provide their email addresses, which were used to send a $5 amazon.com gift card to the participant. All participants were given the primary investigator’s contact information for questions or concerns. The measures were presented in a counterbalanced order. The average time to complete the measures was approximately 15 minutes. After completion of the survey participants received an
amazon.com gift certificate for $5 within 72 hours via the email address provided after completing the survey. All of the data remained confidential with only the principal investigator and her faculty advisor having access to it. Data could not be linked to the email addresses of participants. In an effort to encourage participation, an email similar to the initial recruitment e-mail was sent to students as a follow up about 3 weeks after the initial recruitment email was sent.
CHAPTER 4

RESULTS

This chapter provides a summary of the results of statistical analyses conducted to examine the three mediational models and the specific hypotheses associated with each model, as described in the preceding chapters.

Preliminary Analyses

Four separate counterbalanced data sets were downloaded from the PsycData.com website into SPSS files. Variables in the data sets were re-sorted into the same order and merged into one SPSS file. Several items associated with each measure needed to be reverse scored. New variables were created in SPSS to reflect the composite scores of each of the five measures.

Power Analysis. An a priori power analysis indicated that in order to examine a small-to-medium effect size ($R^2 = .09$), with power = .80 and $\alpha = .025$, a sample size of 120 was needed. The $\alpha$ was set to .025 in order to control for study-wise Type I error because two main models were being tested. The two main models tested included mediational models in which (a) brooding rumination was the mediator of the link between attachment anxiety and depressive symptoms and (b) brooding rumination was the mediator of the link between attachment anxiety and anxiety symptoms. In addition to testing anxiety symptoms in terms of trait anxiety (a more stable and enduring personality characteristic), I also conducted a secondary analysis examining anxiety symptoms in terms of state anxiety (momentary, situationally-based experiences of anxiety.) This secondary analysis was added in order to examine anxiety more comprehensively and
because brooding rumination may have a different impact on stable versus more transient type of anxiety.

**Missing Data.** The data set contained 132 cases. Total percentages of missing data per person were obtained by transferring the data to an EXCEL file for calculation. Five cases were identified in which participants did not complete most of the surveys (i.e., fewer than 26% of the items had been completed). Given that there were only five cases with large percentages of missing data, these cases were deleted from the data set. It was not possible to do an analysis to determine whether these cases differed on particular variables (e.g., demographic information) because this information was also left blank.

The remaining 127 cases were examined to identify participants that were outside the age range (18-30) or whose gender was not female. Four cases were identified and eliminated from the data set because they did not meet criteria for age ($n = 1$) or gender ($n = 3$). After these cases were deleted, the remaining data set contained 123 cases, which contained 0.43% total missing data across measures.

There is substantial debate around how to address missing data (Schlomer, Bauman, & Card, 2010). According to Tabachnick and Fidell (2007) there are no specific agreed upon guidelines to address missing data of a particular sample size. They also suggested that if 5% or less data is missing from a large sample and the data are not missing in a particular pattern, multiple methods to address missing data can provide similar results.

According to Graham (2009) if missing data are determined to be missing completely at random (MCAR), the sample can still provide results close to the
population estimate. Little’s MCAR test, a chi-square test used to determine whether missing data are missing completely at random (MCAR), was conducted for each variable using the missing value analysis option in SPSS. If chi-square test results are significant, it suggests that data are not missing completely at random. In the present study, there were no significant chi-square results for any of the variables, suggesting that the data were MCAR. These findings are summarized in Table 1.

Table 1

Little’s MCAR Test

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<th>Variable</th>
<th>$\chi^2$</th>
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<th>$p$</th>
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<tr>
<td>Brooding Rumination</td>
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<td>Depression</td>
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<td>State Anxiety</td>
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<td>.06</td>
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</table>

One method to address missing data is use of listwise deletion to eliminate all cases containing any missing data from a given data set (Schlomer, Bauman, & Card, 2010). Some researchers caution against using listwise deletion, suggesting that remaining cases may result in a biased sub-sample and subsequently biased analytic results (Bennett, 2001). Listwise deletion and missing data of any kind may result in a loss of statistical power (Graham, 2009). Exploratory analysis indicated that using listwise deletion would result in elimination of up to 12% of cases for a given measure.
Data imputation methods can be used to replace missing values by estimating plausible data through various methods such as mean substitution, regression coefficients, and pattern-matching imputation (Schlomer, Bauman, & Card, 2010). However, each of these methods has its own unique benefits and risks. Recently, it has been suggested that a more complex method to impute data known as multiple imputation (MI) be used to produce less biased results (Schlomer, Bauman, & Card, 2010). MI uses several imputed data sets (usually between 3-5 data sets) and assesses the degree of similarity and difference between the data sets (Schlomer, Bauman, & Card, 2010). Each data set is created using different parameter estimates (e.g., factor loadings, group mean differences, correlations, regression coefficients) and standard errors. Each data set is saved, and parameter estimates are calculated for each of the data sets. A final parameter estimate is obtained by averaging the parameter estimates across the different data sets. According to Schlomer et al., use of standard errors of the analysis of each data set and variance of parameter estimates across the different data sets provides accurate standard errors.

MI was conducted using the multiple MI option in SPSS. Variables in the original data set were analyzed for means, standard deviations, skewness and kurtosis. Variables in the imputed data set were analyzed for means and standard deviations. Means and standard deviations of the imputed and original data sets were similar. These are summarized in Table 2.
Table 2

Descriptive Statistics

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<td>12.95</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The imputed data set was used for the remaining analyses.

Correlations among variables. Intercorrelations were examined between the study variables to determine whether high correlations ($r > .90$; Field, 2009) existed between variables within each of the three mediational models tested. There were no correlations of this magnitude found among the predictor (attachment anxiety), mediator (brooding rumination) and outcome variables (depressive symptoms, state anxiety, trait anxiety). A summary of bivariate correlations are included in Table 3. Significant correlations were found among all the variables within each individual model.
Table 3

*Intercorrelations Among Study Variables: Attachment Anxiety, Brooding Rumination, Depression, Trait Anxiety, State Anxiety*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attachment Anxiety (n = 123)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Brooding Rumination (n = 123)</td>
<td></td>
<td>.39*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Depression (n = 123)</td>
<td>.35*</td>
<td></td>
<td>.64*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Trait Anxiety (n = 123)</td>
<td>.38*</td>
<td>.68*</td>
<td></td>
<td>.81*</td>
<td></td>
</tr>
<tr>
<td>5. State Anxiety (n = 123)</td>
<td>.42*</td>
<td>.53*</td>
<td>.77*</td>
<td></td>
<td>.73*</td>
</tr>
</tbody>
</table>

*p < .01 level (2-tailed)

**Demographic information.** The average age of participants was 22 years (SD = 2.87). Race, sexual orientation, religious/spiritual denomination/affiliation and years in school of participants are summarized in tables 4, 5, 6 and 7 respectively.
<table>
<thead>
<tr>
<th>Racial/ethnic group</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/African American</td>
<td>11</td>
<td>9%</td>
</tr>
<tr>
<td>Asian American/Pacific Islander</td>
<td>7</td>
<td>5.7%</td>
</tr>
<tr>
<td>White/European American</td>
<td>102</td>
<td>82.9%</td>
</tr>
<tr>
<td>Hispanic/Latino/a</td>
<td>7</td>
<td>5.7%</td>
</tr>
<tr>
<td>Chinese</td>
<td>3</td>
<td>2.4%</td>
</tr>
<tr>
<td>Asian Indian</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other Asian</td>
<td>1</td>
<td>.8%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>3</td>
<td>2.4%</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>4.8%</td>
</tr>
</tbody>
</table>
### Table 5

**Sexual Orientation of Participants**

<table>
<thead>
<tr>
<th>Sexual Orientation</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gay</td>
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<td>.8%</td>
</tr>
<tr>
<td>Lesbian</td>
<td>3</td>
<td>2.4%</td>
</tr>
<tr>
<td>Bisexual</td>
<td>6</td>
<td>4.9%</td>
</tr>
<tr>
<td>Queer</td>
<td>1</td>
<td>.8%</td>
</tr>
<tr>
<td>Heterosexual</td>
<td>108</td>
<td>87.8%</td>
</tr>
<tr>
<td>Don't know or not sure</td>
<td>3</td>
<td>2.4%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.8%</td>
</tr>
</tbody>
</table>

### Table 6

**Religious/Spiritual Denomination/Affiliation of participants**

<table>
<thead>
<tr>
<th>Denomination</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian</td>
<td>75</td>
<td>61.0%</td>
</tr>
<tr>
<td>Jewish</td>
<td>6</td>
<td>4.9%</td>
</tr>
<tr>
<td>Religious Affiliation</td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>Muslim/Islam</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>Buddhist</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>Spiritual/non-religious</td>
<td>6</td>
<td>4.9%</td>
</tr>
<tr>
<td>Agnostic</td>
<td>15</td>
<td>12.2%</td>
</tr>
<tr>
<td>Atheist</td>
<td>7</td>
<td>5.7%</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

**Table 7**

*Years in School*

<table>
<thead>
<tr>
<th>Years in School</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>4</td>
<td>3.3%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>15</td>
<td>12.2%</td>
</tr>
<tr>
<td>Junior</td>
<td>26</td>
<td>21.1%</td>
</tr>
<tr>
<td>Senior</td>
<td>45</td>
<td>36.6%</td>
</tr>
<tr>
<td>Graduate Student</td>
<td>32</td>
<td>26.0%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
Main Analyses

In order to test the two core models (brooding rumination as a mediator of the link between attachment anxiety and depressive symptoms and brooding rumination as a mediator of the link between attachment anxiety and trait anxiety), as well as an additional secondary model (brooding rumination as a mediator of the link between attachment anxiety and state anxiety), three meditational models were tested using the Baron and Kenny (1986) method of testing mediation. The four steps described by Baron and Kenny (1986) were followed to test each model.

Mediational Model 1. Brooding rumination was hypothesized to partially mediate the relation between attachment anxiety and depression (see Figure 4).

Figure 4

Model 1: Rumination as a Mediator of Attachment Anxiety and Depression

The first step in testing mediational model 1 examined Sub-Hypothesis 1:

There will be a direct relation between attachment anxiety and depression (Path c).

A regression analysis with attachment anxiety as the predictor variable and depression as the criterion variable was conducted. Attachment anxiety significantly predicted
depression, $\beta = .33, t(121) = 3.96, p < .001, R^2 = .12,$ with higher levels of attachment anxiety linked to higher levels of depressive symptoms.

The second step in testing the mediational model examined Sub-Hypothesis 2: *There will be a direct relation between attachment anxiety and brooding rumination (Path a).* Attachment anxiety was entered as a predictor variable and brooding rumination was entered as the criterion variable in a regression analysis. Attachment anxiety significantly predicted brooding rumination, $\beta = .37, t(121) = 3.79, p < .001, R^2 = .15,$ with higher levels of attachment anxiety associated with higher levels of brooding rumination.

The third step in testing mediation, which was associated with a third regression equation, examined Sub-Hypothesis 3: *There will be a direct relation between brooding rumination and depression (Path b).* In this regression depression was entered as the criterion variable, and brooding rumination as the predictor variable. These results indicated a relation between brooding rumination and depression, $\beta = .63, t(120) = 8.4, p < .001, R^2 = .41.$ Higher levels of brooding rumination were linked to higher levels of depressive symptoms.

A hierarchical regression was conducted with depression as the dependent variable. Attachment anxiety was entered in the first block and brooding rumination entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine Sub-Hypothesis 4: *Brooding rumination will mediate the relationship between attachment anxiety and depression (Path c’).*
In order for brooding to completely mediate the relation between attachment anxiety and depression, the effect of attachment anxiety on depression while controlling for rumination must not be significantly different from zero. The results of the second block of the hierarchical regression indicated that there was no significant relation between attachment anxiety and depression when brooding rumination was controlled, suggesting full mediation: $\beta = .11$, $t(120) = 1.29$, $p = .21$. Moreover, the standardized regression coefficient reduced ($\beta$ reduced by .22 from $\beta$ in regression 1 (.33) to $\beta$ in model 2 of the hierarchical regression (.11). In order to determine if the reduction in the direct effect of the predictor (attachment anxiety) in the presence of the mediator (brooding) was significant, the Sobel (1982) test was used. The Sobel test uses the unstandardized regression coefficients and standard errors of the paths between initial variable and the mediator and the mediator and the outcome variable. The Sobel $z$ statistic was significant ($z = 3.45$, $p < .001$). Results supported the overarching hypothesis for Model 1 that brooding would partially mediate the link between attachment anxiety and depression. These results are summarized in Table 8.

Table 8

**Model 1: Mediation regression results**

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Path C</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Depression</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.63*</td>
<td>.16</td>
<td>.33*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2: Path A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Brooding</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.22*</td>
<td>.06</td>
<td>.37*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3: Path B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.41</td>
</tr>
</tbody>
</table>
Outcome: Depression
Predictor: Brooding

\[ 2.01^* .24 .63^* \]

*Step 4: Path C’*

Outcome: Depression
Block 2
Mediator: Brooding
Predictor: Attachment Anxiety

\[ .42 \]
\[ 1.87^* .28 .59^* \]
\[ .21 .17 .11 \]
\[ 3.45^* \]

*p < .01; Results in Step 4 are presented for model 2 of the hierarchal regression.*

**Mediational Model 2.** Brooding rumination was hypothesized to partially mediate the relation between attachment anxiety and trait anxiety (see Figure 5).

Figure 5

*Model 2: Rumination as a Mediator of Attachment Anxiety and Trait Anxiety*

![Diagram showing mediation model](attachment)

The first step in testing mediation examined sub-hypothesis 1: There will be a direct relation between attachment anxiety and trait anxiety (Path c). A regression containing attachment anxiety as the predictor variable and trait anxiety as the criterion variable was tested. Attachment anxiety significantly predicted trait anxiety, \( \beta = .36 \), \( t(121) = 4.37 \),
with higher levels of attachment anxiety linked to higher levels of trait anxiety symptoms.

The second step in testing mediation examined hypothesis 2: There will be a direct relation between attachment anxiety and brooding rumination (Path a). Attachment anxiety was entered as a predictor variable and brooding rumination was entered as the criterion variable. Attachment anxiety significantly predicted brooding rumination, $\beta = .37, t(121) = 3.79, p < .001, R^2 = .15$, with higher levels of attachment anxiety associated with higher levels of brooding rumination.

The third step, which is associated with a third regression equation, examined hypothesis 3: There will be a direct relation between brooding rumination and trait anxiety (Path b). In this regression trait anxiety was entered as the criterion variable and brooding as the predictor variable. These results indicated a relation between brooding rumination and trait anxiety, $\beta = .68, t(120) = 9.6, p < .001, R^2 = .46$. Higher levels of brooding rumination were linked to higher levels of trait anxiety symptoms.

A hierarchical regression was conducted with trait anxiety as the dependent variable. Attachment anxiety was entered in the first block and brooding rumination entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine Sub-Hypothesis 4: Brooding rumination will mediate the relationship between attachment anxiety and trait anxiety (Path c').

In order for brooding to completely mediate the relation between attachment anxiety and trait anxiety, the effect of attachment anxiety on trait anxiety while controlling for rumination must be not significantly different from zero. The results of
the second block of the hierarchical regression indicated that there was no significant relation between attachment anxiety and depression when brooding rumination was controlled, suggesting full mediation, $\beta = .13$, $t(120) = .1.7$, $p < .089$. Moreover, the standardized regression coefficient reduced ($\beta$ reduced by .24 from $\beta$ in regression 1 (.36) to $\beta$ in model 2 of the hierarchical regression (.13). In order to determine if the reduction in the direct effect of the predictor (attachment anxiety) in the presence of the mediator (brooding) was significant, the Sobel (1982) test was used. The Sobel test uses the unstandardized regression coefficients and standard errors of the paths between initial variable and the mediator and the mediator and the outcome variable. The Sobel $z$ statistic was significant ($z = 3.43$ $p < .001$). Results supported the overarching hypothesis for Model 2 that brooding would mediate the link between attachment anxiety and trait anxiety, but evidence supported full rather than partial mediation. These results are summarized in Table 9.

Table 9

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Path C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Trait Anxiety</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.72*</td>
<td>.16</td>
<td>.36*</td>
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<tr>
<td>Step 2: Path A</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Outcome: Brooding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.22*</td>
<td>.06</td>
<td>.37*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3: Path B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Trait Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: Brooding</td>
<td>2.29</td>
<td>.24</td>
<td>.68*</td>
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</table>
Step 4: Path C’

<table>
<thead>
<tr>
<th>Block 2</th>
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<td></td>
<td>Predictor: Attachment Anxiety</td>
<td>2.12*</td>
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<td></td>
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<td>.26</td>
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</table>

*p < .01; Results in Step 4 are presented for model 2 of the hierarchal regression

**Mediational Model 3.** Brooding rumination was hypothesized to partially mediate the relation between attachment anxiety and state anxiety (see Figure 6).

**Figure 6**

*Model 3: Rumination as a Mediator of Attachment Anxiety and State Anxiety*

The first step in testing mediation examined sub- hypothesis 1: *There will be a direct relation between attachment anxiety and state anxiety (Path c).* A regression containing attachment anxiety as the predictor variable and state anxiety as the criterion variable was tested using SPSS. Attachment anxiety significantly predicted state anxiety, \( \beta = .42, t(121) = 4.9, \ p < .001, \ R^2 = .18, \) with higher levels of attachment anxiety linked to higher levels of state anxiety symptoms.

The second step in testing the mediational model examined hypothesis 2: *There will be a direct relation between attachment anxiety and brooding rumination (Path a).*
Attachment anxiety was entered as a predictor variable and brooding rumination was entered as the criterion variable. Attachment anxiety significantly predicted brooding rumination, $\beta = .37$, $t(121) = 3.8$, $p < .001$, $R^2 = .15$, with higher levels of attachment anxiety associated with higher levels of brooding rumination.

The third step in testing mediation, which is associated with a third regression equation, examined hypothesis 3: \textit{There will be a direct relation between brooding rumination and state anxiety (Path b)}. In this regression state anxiety was entered as the criterion variable, and brooding rumination as the predictor variable. These results indicated a relation between brooding rumination and state anxiety, $\beta = .54$, $t(120) = 6.0$, $p < .001$, $R^2 = .28$. Higher levels of brooding rumination were linked to higher levels of state anxiety symptoms.

A hierarchical regression was conducted with state anxiety as the dependent variable and attachment anxiety was entered in the first block and brooding rumination entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine Sub-hypotheses 4: \textit{Brooding rumination will mediate the relationship between attachment anxiety and state anxiety (Path c')}. In order for brooding to completely mediate the relation between attachment anxiety and state anxiety, the effect of attachment anxiety on depression while controlling for rumination must not be significantly different from zero. The results of the second block of the hierarchical regression indicated that there was still was a relation between attachment anxiety and state anxiety and therefore there was not full mediation $\beta = .26$, $t(120) = 2.73$, $p = .009$. However, the standardized regression coefficient ($\beta$ reduced by .16 from $\beta$ in regression 1 (.42) to $\beta$ in regression 3 (.26). In
order to determine if this was significant, the Sobel test (Sobel, 1982) was used. The Sobel $z$ statistic was significant ($z = 3.13, p < .001$). Therefore, partial mediation was established. These results are summarized in Table 10.

Table 10

*Model 3: Mediation regression results*

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Path C</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Outcome: State Anxiety</td>
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<tr>
<td>Predictor: Attachment Anxiety</td>
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<td>1.85</td>
<td>.42*</td>
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<tr>
<td><strong>Step 2: Path A</strong></td>
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</tr>
<tr>
<td>Outcome: Brooding</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.22*</td>
<td>.06</td>
<td>.37*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3: Path B</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: State Anxiety</td>
<td>.28</td>
<td></td>
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</tr>
<tr>
<td>Predictor: Brooding</td>
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<td>.33</td>
<td>.54*</td>
<td></td>
<td></td>
</tr>
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<td><strong>Step 4: Path C’</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: State Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block 2</td>
<td>.34</td>
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</tr>
<tr>
<td>Mediator: Brooding</td>
<td>1.6*</td>
<td>.37</td>
<td>.44*</td>
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</tr>
<tr>
<td>Predictor: Attachment Anxiety</td>
<td>.55*</td>
<td>.20</td>
<td>.26*</td>
<td>3.13*</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01; Results in Step 4 regression are presented for model 2 of the hierarchal regression*
**Additional Analysis**

In order to rule out the possibility that mediation may work in the opposite direction, reverse mediation was analyzed for each of the three models.

**Reverse Mediational Model 1.** Brooding rumination was hypothesized to partially mediate the relation between depression and attachment anxiety (see Figure 7).

Figure 7

*Reverse Model 1: Rumination as a Mediator of Depression and Attachment Anxiety*

The first step in testing the reverse mediational model 1 examined Sub-Hypothesis 1: *There will be a direct relation between depression and attachment anxiety (Path c)*. A regression analysis with depression as the predictor variable and attachment anxiety as the criterion variable was conducted. Depression significantly predicted attachment anxiety, $\beta = .37$, $t (121) = 3.93$, $p < .001$, $R^2 = .12$, with higher levels of depressive symptoms linked to higher levels of attachment anxiety symptoms.
The second step in testing the mediational model examined Sub-Hypothesis 2: *There will be a direct relation between depression and brooding rumination (Path a).* Depression was entered as a predictor variable and brooding rumination was entered as the criterion variable in a regression analysis. Depression significantly predicted brooding rumination, \( \beta = .65, t(121) = 8.55, p < .001, R^2 = .40 \), with higher levels of depressive symptoms associated with higher levels of brooding rumination.

The third step in testing mediation, which was associated with a third regression equation, examined Sub-Hypothesis 3: *There will be a direct relation between brooding rumination and attachment anxiety (Path b).* In this regression attachment anxiety was entered as the criterion variable, and brooding rumination as the predictor variable. These results indicated a relation between brooding rumination and attachment anxiety \( \beta = .41, t(120) = 3.7, p > .001, R^2 = .15 \). Higher levels of brooding rumination were linked to higher levels of attachment anxiety symptoms.

Although, step 3 in testing for mediation was not significant, Baron and Kenny (2012) cautioned that the steps should not be defined in terms of statistical significance because coefficients may not be significant, yet still reflect important effects. For that reason, although step 3 did not support mediation when examined in terms of statistical significance, a hierarchical regression was conducted with attachment anxiety as the dependent variable and depression was entered in the first block and brooding rumination entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine Sub-Hypothesis 4: *Brooding rumination will mediate the relationship between depression and attachment anxiety (Path c’).* In order to establish brooding rumination as completely mediate the relation
between depression and attachment anxiety, the effect of depression on attachment anxiety while controlling for rumination must be not significantly different from zero.

The results of the second block of the hierarchical regression indicated that there was not a significant relation between depression and attachment anxiety and therefore there was not full mediation: $\beta = .18$, $t(120) = 1.27$, $p = .212$. However, $\beta$ reduced by .19 from $\beta$ in regression 1 (.37) to $\beta$ in regression 3 (.18). In order to determine if this was significant, the Sobel (1982) test was used. The Sobel $z$ statistic was significant ($z = 3.5$, $p > .001$). Thus, reverse mediation cannot be ruled out. These results are summarized in Table 11.

Table 11

Reverse Model 1: Mediation Regression Results

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>Sobel</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Path C</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Attachment Anxiety</td>
<td>.12</td>
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<td>Outcome: Attachment Anxiety</td>
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*p < .01; Results in Step 4 are presented for model 2 of the hierarchal regression
**Reverse Mediational Model 2.** Brooding rumination was hypothesized to partially mediate the relation between trait anxiety and attachment anxiety (see Figure 8).

Figure 8  
*Reverse Model 2: Rumination as a Mediator of Trait Anxiety and Attachment Anxiety*

![Diagram of reverse mediational model](image)

The first step in testing reverse mediation examined sub-hypothesis 1: *There will be a direct relation between trait anxiety and attachment anxiety (Path c).* A regression containing trait anxiety as the predictor variable and attachment anxiety as the criterion variable was tested using SPSS. Trait anxiety significantly predicted attachment anxiety, $\beta = .39$, $t(121) = 4.34$, $p < .001$, $R^2 = .14$, with higher levels of trait anxiety symptoms linked to higher levels of attachment anxiety symptoms.

The second step in testing the mediational model examined hypothesis 2: *There will be a direct relation between trait anxiety and brooding rumination (Path a).* Trait anxiety was entered as a predictor variable and brooding rumination was entered as the criterion variable. Trait anxiety significantly predicted brooding rumination, $\beta = .68$,
\( t(121) = 9.57, p < .001, R^2 = .46 \), with higher levels of trait anxiety symptoms associated with higher levels of brooding rumination.

The third step in testing mediation, which was associated with a third regression equation, examined Sub-Hypothesis 3: *There will be a direct relation between brooding rumination and attachment anxiety (Path b).* In this regression attachment anxiety was entered as the criterion variable, and brooding rumination as the predictor variable. These results indicated a relation between brooding rumination and attachment anxiety \( \beta = .41, t(120) = 3.7, p > .001, R^2 = .15 \). Higher levels of brooding rumination were linked to higher levels of attachment anxiety symptoms.

Although, step 3 in testing for mediation was not significant, Baron and Kenny (2012) cautioned that the steps should not be defined in terms of statistical significance because coefficients may not be significant, yet still reflect important effects. For that reason, although step 3 did not support mediation when examined in terms of statistical significance, a hierarchical regression was conducted with attachment anxiety as the dependent variable. Trait anxiety was entered in the first block and brooding rumination was entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine Sub-Hypothesis 4: *Brooding rumination will mediate the relationship between trait anxiety and attachment anxiety (Path c’).* In order for brooding rumination to completely mediate the relation between trait anxiety and attachment anxiety, the effect of attachment anxiety on depression while controlling for rumination must not be significantly different from zero. The results of the second block of the hierarchical regression indicated that there was not a significant relation between trait anxiety and attachment
anxiety and therefore there was not full mediation $\beta = .22$, $t(120) = 1.6$, $p = .11$.

However, $\beta$ reduced by .18 from $\beta$ in regression 1 (.39) to $\beta$ in regression 3 (.22). In order to determine if this was significant, the Sobel test (Sobel, 1982) was used. The Sobel $z$ statistic was significant ($z = 3.5$, $p < .001$). Thus, reverse mediation cannot be ruled out. These results are summarized in Table 12.

Table 12

Reverse Model 2: Mediation regression results

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
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<th>$SE$</th>
<th>$\beta$</th>
<th>Sobel</th>
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<td>.05</td>
<td>.39*</td>
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<td>Outcome: Brooding</td>
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<tr>
<td>Predictor: Trait Anxiety</td>
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<td><strong>Step 3: Path B</strong></td>
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<td>Outcome: Attachment Anxiety</td>
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<tr>
<td>Predictor: Brooding</td>
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<tr>
<td><strong>Step 4: Path C’</strong></td>
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<td>Outcome: Attachment Anxiety</td>
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<td>Block 2</td>
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<tr>
<td>Mediator: Brooding</td>
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<td>.25*</td>
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<td>Predictor: Trait Anxiety</td>
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</table>

*$p < .01$; Results in Step 4 are presented for model 2 of the hierarchal regression

**Reverse Mediational Model 3.** Brooding rumination was hypothesized to partially mediate the relation between state anxiety and attachment anxiety (see Figure 9).
The first step in testing reverse mediation examined sub-hypothesis 1: There will be a direct relation between state anxiety and attachment anxiety (Path c). A regression containing state anxiety as the predictor variable and attachment anxiety as the criterion variable was tested using SPSS. State anxiety significantly predicted attachment anxiety, $\beta = .43$, $t(121) = 4.84$, $p < .001$, $R^2 = .18$, with higher levels of state anxiety symptoms linked to higher levels of attachment anxiety symptoms.

The second step in testing mediation examined hypothesis 2: There will be a direct relation between state anxiety and brooding rumination (Path a). State anxiety was entered as a predictor variable and brooding rumination was entered as the criterion variable. State anxiety significantly predicted brooding rumination, $\beta = .51$, $t(121) = 6.18$, $p < .001$, $R^2 = .28$, with higher levels of state anxiety symptoms associated with higher levels of brooding rumination.

The third step in testing mediation, which was associated with a third regression equation, examined Sub-Hypothesis 3: There will be a direct relation between 

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**Figure 9**

*Reverse Model 3: Rumination as a Mediator of State Anxiety and Attachment Anxiety*
rumination and attachment anxiety (Path b). In this regression attachment anxiety was entered as the criterion variable, and brooding rumination as the predictor variable. These results indicated a relation between brooding rumination and attachment anxiety $\beta = .41$, $t(120) = 3.7, p > .001, R^2 = .15$. Higher levels of brooding rumination were linked to higher levels of attachment anxiety symptoms.

Although, step 3 in testing for mediation was not significant, Baron and Kenny (2012) cautioned that the steps should not be defined in terms of statistical significance because coefficients may not be significant, yet still reflect important effects. For that reason, although step 3 did not support medication when examined in terms of statistical significance, a hierarchical regression was conducted with attachment anxiety as the dependent variable. State anxiety was entered in the first block and brooding rumination entered in the second block. The results of this hierarchical regression were examined to complete the fourth step in testing mediation and examine hypotheses 4: Brooding rumination will mediate the relationship between state anxiety and attachment anxiety (Path c’). In order for brooding to completely mediate the relation between state anxiety and attachment anxiety, the effect of state anxiety on attachment anxiety while controlling for rumination would be zero. The results of the second block of the hierarchical regression indicated that there still was a relation between state anxiety and attachment anxiety and therefore there was not full mediation $\beta = .3, t(120) = 2.62, p < .01$. However, $\beta$ reduced from $\beta = .43$ in regression 1 to $\beta = .3$ in regression 3. In order to determine if this was significant, the Sobel test (Sobel, 1982) was used. The Sobel $z$ statistic was significant ($z = 3.3, p > .001$). Thus, reverse mediation cannot be ruled out. These results are summarized in Table 13.
Table 13

*Reverse Model 3: Mediation regression results*

<table>
<thead>
<tr>
<th>Testing Steps in Mediation</th>
<th>$R^2$</th>
<th>$B$</th>
<th>SE</th>
<th>$\beta$</th>
<th>Sobel</th>
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</thead>
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<td></td>
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<td>Outcome: Attachment Anxiety</td>
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<tr>
<td>Predictor: State Anxiety</td>
<td></td>
<td>.20*</td>
<td>.04</td>
<td>.43*</td>
<td></td>
</tr>
</tbody>
</table>

**Step 2: Path A**

| Outcome: Brooding         | .28   |      |      |         |       |
| Predictor: State Anxiety  |       | .14* | .02  | .51*    |       |

**Step 3: Path B**

| Outcome: Attachment Anxiety| .15   |      |      |         |       |
| Predictor: Brooding        |       | .69* | .18  | .41*    |       |

**Step 4: Path C’**

| Outcome: Attachment Anxiety Block 2 | .22   |      |      |         |       |
| Mediator: Brooding             |       | .41* | .23  | .24*    |       |
| Predictor: State Anxiety       |       | .14  | .05  | .30 3.3*|       |

*p < .01; Results in Step 4 are presented for model 2 of the hierarchical regression*
DISCUSSION

This chapter will discuss the previously presented results, as well as potential implications of those results. Implications of findings of the present study will be discussed within the context of treatment of anxiety and depression. The limitations of the present study will then be reviewed, followed by suggestions for future directions for psychological research.

The purpose of the present study was to examine brooding rumination as a mediator of links between attachment anxiety (a preoccupation with relationships and the potential for rejection in relationships; Brennan et al., 1998) and psychological symptoms. Attachment anxiety has been empirically linked to psychological symptoms (Mallinckrodt & Wei, 2005; Wei, Heppner, & Mallinckrodt, 2003; Vogel & Wei, 2005), so it is important to understand the mechanisms through which that association may occur. Brooding rumination was selected as an important potential mediating mechanism for a number of reasons. First, attachment anxiety is theorized to be linked with a hyperactivating strategy of emotion regulation (Cassidy & Kobak, 1988), and rumination can be conceptualized as a maximizing strategy because it involves a focus on negative affect (Mikulincer & Shaver, 2007, Main, 1990). Second, previous research has supported brooding rumination as a mediator of the link between attachment anxiety and depressive symptoms (Saffrey & Ehrenberg, 2007), although no previous studies were identified that focused on brooding rumination as a potential mediator of the link between attachment anxiety and anxiety symptoms. Thus, the present study aimed to replicate previous research focusing on depressive symptoms, and extend that research to examine mechanisms involved in anxiety symptoms. Results of the present study support a model
in which attachment anxiety leads to a maximizing strategy of brooding rumination, which in turn, leads to increased symptoms.

**Findings of Main and Supplemental Analyses**

One of the primary goals of this study was to replicate and extend Saffrey and Ehrenberg’s (2007) study, which examined rumination as a mediator of attachment anxiety and depression. In order to test the two core models mediational models (brooding as a mediator of the link between attachment anxiety and depressive symptoms and brooding as a mediator of the link between attachment anxiety and trait anxiety), as well as an additional secondary model (brooding as a mediator of the link between attachment anxiety and state anxiety), three meditational models were examined. First, the present study replicated the study Saffrey and Ehrenberg study using a similar design and similar methods. The present study extended the Saffrey and Ehrenberg study by using a measure of a specific type of rumination known as brooding rumination. Brooding captures a type of rumination that tends to include thought content that is negative and related to one’s depressed mood and is particularly maladaptive (Treynor et al., 2003; Nolen-Hoeksema et. al., 2008). The measure of rumination used by Saffrey and Ehrenberg was created by the authors for that particular study and it did not have established psychometric properties. In the present investigation a measure of brooding rumination was used that been used in multiple previous studies and has been shown to have established psychometric properties.

Participants in the present study differed from those in the Saffrey and Ehrenberg (2007) study. In the present study participants were female college students between the ages 18-30. The present study did not limit participants to those who have recently gone
through a romantic break-up, as was the case in the Saffrey and Ehrenberg study. One goal of the present study was to allow generalization of the results to a wider population, rather than being limited to those who had recently undergone the ending of a romantic relationship. In the present study, the sample was limited to women because there may be differences in the development and maintenance of psychological distress in women and men. Thus, given the size of the sample, having a more homogeneous sample in terms of gender allowed for greater clarity on the mechanisms involved for that group, avoiding potential confounds due to gender.

**Model 1.** The first goal of the study was to replicate past findings by Saffrey and Ehrenberg (2007) by examining a mediational model in which brooding rumination was proposed as a mediator of the association between attachment anxiety and depressive symptoms. Consistent with Saffrey and Ehrenberg’s findings, results indicated that brooding rumination was a significant partial mediator in the link between attachment anxiety and depressive symptoms. Past studies have shown that attachment anxiety is linked to greater depressive symptoms (Wei, Heppner & Mallincrodt, 2003; Vogel & Wei, 2005). Also, attachment anxiety has been shown to be related to greater levels of rumination (Collins, et al., 2006; Saffrey & Ehrenberg, 2007) and rumination has been linked to greater depression (Treynor et al., 2003). Results of the present study, like those of Saffrey and Ehrenberg (2007), support the idea that brooding rumination serves as an explanatory mechanism for the association between attachment anxiety and depressive symptoms. Moreover, the present study provides evidence that brooding rumination fully mediates the association between attachment anxiety and depressive symptoms not only
in those who have recently experienced the ending of a romantic relationship, but also in a more general sample college women, regardless of romantic relationship status.

**Model 2.** The second goal of the study was to extend the research of Saffrey and Ehrenberg (2007) by examining brooding rumination as a mediator of the relation between attachment anxiety and anxiety symptoms. Given that, to my knowledge, this was the first study that examined anxiety symptoms in this type of mediation model, two distinct measures of anxiety were used. The primary focus was on trait anxiety because, like the other key variables in the study (e.g., attachment anxiety), trait anxiety is fairly stable (Spielberger, et al., 1983). The expectation was that although state anxiety may vary depending on the specifics of the situation, a tendency towards brooding rumination would mediate the effects of attachment anxiety on trait anxiety, even if not state anxiety.

As expected, brooding rumination did in fact significantly fully mediate the link between attachment anxiety and trait anxiety symptoms in the sample. Results were consistent with previous research, which has shown that attachment anxiety is linked to greater anxiety symptoms (Mikulincer & Shaver, 2007; Mallincrodt & Wei, 2005), that attachment anxiety is related to greater rumination (Collins, et al., 2006; Saffrey & Ehrenberg, 2007), and that rumination is linked to greater anxiety (Nolen-Hoeksema, 2000; Raes, 2010). The main goal in examining model 2 was to test the hypothesis that brooding rumination mediates the relation between attachment anxiety and trait anxiety symptoms. Results supported the mediational hypothesis and extended previous research focusing on mechanisms for the link between attachment anxiety and depressive symptoms by providing support for brooding rumination as a mediator of the link between attachment anxiety and trait anxiety (not just depression).
**Model 3.** Finally, the third model assessed brooding rumination as a mediator of attachment anxiety and the more present-focused form of anxiety, state anxiety. State anxiety, also known as present-level anxiety, differs from trait anxiety which captures a general and long standing type of anxiety (Spielberger, et al., 1983) Again, results extended previous literature by finding that brooding rumination does in fact significantly partially mediate the link between attachment anxiety and state anxiety symptoms.

Results of the present study are once again consistent with previous research indicating that attachment anxiety is linked to greater anxiety symptoms (Mikulincer & Shaver, 2007; Mallincrodt & Wei, 2005), that attachment anxiety relates to greater rumination (Collins, et al., 2006; Saffrey & Ehrenberg, 2007), and that rumination has been linked to greater anxiety (Nolen-Hoeksema, 2000; Raes, 2010). Results of the present study were consistent with the hypothesis that brooding rumination mediates the relation between attachment anxiety and state anxiety symptoms. Thus, results of the present study extended previous research by providing support for brooding rumination as a mediator of the link between attachment anxiety and state anxiety, as well as of the link between attachment anxiety and trait anxiety. Brooding rumination therefore, is an important mechanism in the link between attachment anxiety and both more stable tendencies to anxiety and more situationally-based anxiety.

In sum, results showed that brooding rumination served as a full mediator not only of the link between attachment anxiety and depressive symptoms, as had been found in previous research (Saffrey & Ehrenberg, 2007); but also indicated that brooding rumination fully mediated the links between attachment anxiety and the more stable type of anxiety, trait anxiety.
Results also showed that brooding rumination partially mediated the links between attachment anxiety and the more present focused state anxiety (Spielberger et al., 1983).

Interestingly the two models that were fully mediated were those with stable longer standing forms of psychological distress (depressive symptoms and trait anxiety) whereas the more present-focused type of psychological distress, state anxiety, was partially mediated. Although the results were significant for each of the three models, this distinction between the impact brooding rumination has on stable forms of psychological distress may be an important area for future research.

Thus, results highlight the importance of brooding rumination and its role in development and maintenance of symptoms of psychological distress (i.e., depressive symptoms, anxiety symptoms).

Attachment anxiety is theorized to involve hyperactivating strategies of emotion regulation. Brooding rumination is consistent with a maximizing strategy and helps to explain the mechanism through which attachment anxiety can result in symptoms. Previous research has only examined role of brooding rumination in depression. A major contribution of the present study is showing that brooding also mediates link between attachment anxiety and anxiety symptoms. It is important, however, to rule out the possibility that mediation may actually work in the opposite direction. Theoretically it makes sense that attachment develops first and therefore attachment anxiety leads to brooding, which in turn leads to symptoms. It is conceptually possible, however, that symptoms could lead to brooding which in turn could result in insecurity of attachment, and so this possibility needed to be tested.
Additional Analysis

To that end, reverse mediational models were examined for each of the three mediational models examined in the study. After briefly reviewing these results, the implications of findings will be discussed.

**Reverse mediational model 1.** The reverse mediational model examining brooding rumination as a partial mediator of depressive symptoms and attachment anxiety was analyzed. Results indicated that brooding rumination was a significant partial mediator in the link between depressive symptoms and attachment anxiety among participants. Thus, it was impossible to rule out the possibility of reverse mediation. These results were surprising given that past research has shown that attachment develops in infancy and childhood as a result of caregiver responsiveness to infant and children’s needs (Ainsworth et al., 1978) and is carried beyond infancy through internal working models (Bowlby, 1988). In contrast, the result for reverse mediation model 1 was consistent with the notion that depressive symptoms cause increased brooding, which then changes attachment, which is not consistent with the idea that attachment develops first. It may be that depressive symptoms can have a tendency to increase brooding, and that this brooding may then increase thoughts of anxiety about relationships. Longitudinal research that examines attachment, brooding, and symptoms over time will be very important in sorting out the temporal sequencing of these variables, explore whether it is more likely that the mediation works in one direction or ther other, and examine whether there may even be a transactional process.

**Reverse mediational model 2.** The reverse mediational model examining brooding rumination as a partial mediator of trait anxiety symptoms and attachment
anxiety was analyzed. Results indicated that brooding rumination was a significant partial mediator in the link between trait anxiety and attachment anxiety among participants. Support for reverse mediation model 2 was surprising given that it is consistent with the notion that trait anxiety causes increased brooding, which then changes attachment. Such a result was unexpected, because it was theorized that attachment develops first. Nevertheless, results suggested that reverse mediation could not be ruled out. Again, longitudinal research will be helpful in better understanding the links between these variables over time.

**Reverse mediational model 3.** The reverse mediational model examining brooding rumination as a partial mediator of state anxiety symptoms and attachment anxiety was analyzed. Results indicated that brooding rumination was a significant partial mediator in the link between state anxiety and attachment anxiety among participants. Again, these results found for the reverse mediation model 3 were surprising given that they are consistent with the notion that state anxiety causes increased brooding, which then changes attachment. As mentioned earlier, these results were unexpected because it was theorized that attachment develops first. As before, further research will be very useful in better understanding the temporal links between the variables.

In sum, results supported both the proposed mediational models, and the alternative reverse mediation models. However, it should also be noted that the degree to which the mediator and predictor together accounted for variance in the outcome in the original three models was large in effect, whereas the effect size for the degree to which mediator and predictor together predicted outcome in the reverse models were medium size. Still, these reverse mediation model findings did indicate that reverse mediation
could not be ruled out and more research will be needed to examine the reverse mediation models.

**Rumination as a Mediator**

Recent research has continued to examine rumination as a mediating factor in psychological distress. A recent study examined rumination as a mediator of uncertainty and depression and uncertainty and anxiety (Liao & Wei, 2011). Results of this study found rumination to fully mediate the relation between uncertainty and depression and partially mediate the relation between uncertainty and anxiety. Another study found rumination to completely mediate the relation between irrational beliefs and distress (Lucian, 2011). Results of a study of adolescents found that the quality of various attachment relations were associated with rumination and depressive symptoms (Ruijten, Roelofs, & Rood, 2011). These recent studies, along with results of the present study, continue to add to the growing body of evidence suggesting that rumination is an important factor in the etiology and progression of anxiety and depression.

To summarize, results of the present study extend this area of research in several ways. Although brooding has been examined in past research as a form of rumination (Burwell & Shirk, 2007; Raes, Schoofs, Hoes, Hermans, Van Den Eede, & Franck, 2009) the present study is the first study to examine brooding as a mediator of attachment anxiety and depressive symptoms in a sample of women that was not selected for having recently experienced a romantic relationship break up, and it is the first to examine brooding rumination as a mediator of the association between attachment anxiety and both trait anxiety and state anxiety).
Clinical Implications

Results in the present study may have important clinical implications for the treatment of anxiety and depression. Treatment approaches to address brooding rumination may be important when treating women with anxiety and/or depression, particularly if these women also appear to have attachment anxiety. Therapists could keep in mind that brooding rumination appeared to be an important factor related to increased psychological distress and may wish to consider treatment approaches that address brooding rumination when working with clients who tend to be highly ruminate.

Targeting rumination is one way therapists can attempt to interrupt the linkage between attachment anxiety and psychological distress among their clients. Cognitive behavioral approaches can be useful in decreasing brooding rumination because of the therapeutic focus on thought processes (such as rumination) and the feelings associated with them. However, focusing on rumination as a way to interrupt the linkage between attachment anxiety and symptoms is only one way to intervene. Interventions focused on helping clients remain with feelings they are experiencing can also be useful. For example, signs of brooding rumination among clients may alert therapists to the possibility that rumination could be tied to underlying feelings, with the repetitive thoughts serving as a defense against experiencing those emotions. Dykas and Cassidy (2011) theorized, based on their review of the literature, that individuals with insecure attachment may exclude potentially painful information from further processing and may instead process information that is unlikely to lead to psychological pain. Similarly, current theories of Generalized Anxiety Disorder emphasize the role of ruminative worry in defending against painful affect (Borkovec, 1994; Hayes et al., 1996; Roemer, Salters, Raffa, &
Orsillo, 2005). Thus, although initial awareness of thoughts may be necessary, facilitating client awareness of underlying emotions may be very helpful. Mindfulness approaches may help those high in attachment anxiety to accept painful affect, rather than defend against feelings through brooding rumination.

Therapists working from an attachment perspective can help clients by providing a secure and consistent form of support, or secure base, in order to decrease attachment anxiety over time (Bowlby, 1988). Bowlby theorized that within the context of a relationship with a therapist who provides a secure base for exploration, clients will be able to re-work insecure working models of attachment, and thus move towards greater security. Therapists should keep pay careful consideration to the interpersonal factors within the client-therapist relationship by remaining cognizant of the way these linkages may play out at an interpersonal level within the therapy session such as by serving as an emotional barrier between the client and therapist or the client and any individual in his or her life. Similarly, if brooding can be viewed as a red flag when it relates to relationship issues, therapists may help the client explore how their brooding influences their romantic relationships.

Therapists working in a relationally-oriented way with clients may be able to speak openly with clients about the way they observe brooding rumination within the therapy session. Rumination can become so automatic and unconscious among some clients that highlighting it in therapy may be helpful not only by facilitating awareness but by discussing ways brooding rumination may influence the goals clients have for therapy. The interventions mentioned represent only a few approaches to to facilitate this type of change in therapy.
Results of the present study are also consistent with previous research suggesting that interpersonal problems are important to address in therapy for ruminative worry. For example, Borkovec, Newman, Pincus, and Lytle (2002) found that for clients who worry (i.e., who have Generalized Anxiety Disorder; GAD), it may be important to pay special attention to interpersonal issues, in addition to cognitive-behavioral treatment for the worry itself. They found that those clients with GAD who did not improve showed evidence of interpersonal problems that remained at the end of treatment. In fact, an interpersonal component was later added to treatment for GAD (Borkovec, Newman, & Castonguay, 2003).

Results of the present study suggested that clients who struggle interpersonally as a result of attachment anxiety and who are thinking repetitively about relationship concerns may be reinforcing their own attachment anxiety. As a result, these clients may have a difficult time improving their relationship circumstances. Understanding the content of the thoughts associated with brooding rumination is at least initially important in order to determine if the thoughts are strongly related to relationship issues. Exploring the feelings related to the ruminative thoughts clients have, and exploring the purpose the thoughts serve may be important. For example, a client with high attachment anxiety may be trying to look for “evidence” that a partner is faithful or not faithful in a relationship.

Certain questions may be useful for clients with relationship issues in order to find out whether rumination plays a role in the interpersonal problems. Ruminative thoughts may be contributing to and maintaining an unhealthy preoccupation with one’s partner or the relationship. Consider a client who is experiences anxiety when her partner is not in regular contact with her. Suppose this client comes in each week thinking about
evidence for her partner’s caring or lack of caring. The following questions may be useful to
determine the impact of brooding rumination on the client: How frequently do you find
yourself thinking about this? Once you come up with evidence for or against your
partner’s caring feeling towards you, what do you think about next? Are you able to let
things go or do you repetitively have the same thoughts over and over again? Such
questions can help determine whether clients are actually coming up with any new helpful
information through their repetitive thinking, consider whether such rumination may serve
an adaptive purpose, or examine the possibility that the outcome of such rumination is
primarily maladaptive. In each case client awareness of his or her tendency to revisit the
same thoughts over and over again may help clients realize the impact this pattern is
having on them—and may help to uncover underlying feelings the client may be
defending against.

My hope is that therapists and researchers consider the implications of these
results broadly, beyond targeting rumination. Anecdotally, my clinical observations have
encouraged me to see there are multiple access points to interrupting this linkage between
attachment anxiety and symptoms, and improving client symptoms. Rumination is clearly
essential to treat and understand more fully through future research because of its
influence of symptoms of anxiety and depression, as well the way in which the experience
of rumination can be a maladaptive, unpleasant experience for many people.

In summary, the findings of this study help provide understanding for the causes
and potential treatment of anxiety and depression. Clinicians should be cognizant of the
role of brooding rumination in clients presenting concerns and researchers should
continue to address such rumination as an important factor in the etiology and maintenance of psychological distress.

**Limitations and Implications for Future Research**

There are several limitations for the present study and these should be considered when considering how the results can be applied to the general population and specific subgroups of the population. First, in terms of demographic factors, the age of participants was limited to between 18 and 30; therefore, the results may not necessarily represent findings among women outside this age range. Moreover, a recent study found that brooding is related to depression among children (Gibb, Grassia, Stone, Uhrlass, & McGeary, 2012); the models examined in the present study should be examined in children. Further, potential forms of treatment to decrease brooding in children should also be explored in future research.

Since only female participants were included in the present study, future studies should examine the mediational models among men. Inclusion of both men and women may allow for examination of gender differences in models explaining psychological symptoms. Although the present study provides important information about female college students, research in the future needs to address other populations beside those in college, including community and clinical samples. Given the rates of depression and anxiety among older women it may be important to explore this population in the future. Studying such a group could take into account the role divorce or death of a long-term partner could have.

In terms of sampling procedures, there were important limitations that must be noted. Although participants were recruited from multiple academic programs, greater
recruitment occurred within programs in education and psychology. There may be certain characteristics common among individuals who are studying education and psychology and therefore they may be different than other college students. Further, these academic programs were geographically limited to three universities. Two of the three schools’ participants were recruited from student populations consisting of mostly white students, resulting in the present sample containing very few participants who self-identified as a member of a racial or ethnic group other than white. Therefore, findings may not extend to individuals who are not racially or ethnically similar to participants in the sample, or those who are not from a similar geographical region. Future studies should also examine the research questions in more diverse samples with regard to sexual orientation, race, and ethnicity.

There are inherent limitations in the use of self-report measures of all variables in the study. Future research could include other methods for assessing attachment and symptoms that could address the limitations associated with use of a mono-methods approach. Biases associated with mono-method approaches can include inflated results. It would be interesting to see whether the mediational model holds when multiple methods of assessment are used.

Importantly, the present study relied on a cross-sectional design. Future research using a longitudinal design would allow for stronger inferences about causation suggested by the mediational models.

There are various treatment approaches that have been shown to be effective at treating anxiety including cognitive-behavioral, mindfulness-based, motivational interviewing, and client-centered approaches (Martin, 2011; Norton & Price, 2007).
Given the results of the present study and the growing body of research on the link between rumination and anxiety and depression, future research should examine the effectiveness of counseling and other treatment interventions that decrease rumination. In the past, several forms of treatment have been effective at decreasing rumination. Cognitive-behavioral therapy treatment approaches have been developed that target rumination, including rumination focused cognitive-behavioral therapy (RFCBT; Watkins, Scott, Wingrove, Rimes, Bathurst et al., 2007) and mindfulness (Jain, Shapiro, Swanick, Roesch & Mills, 2007; Segal, Williams, & Teasdale, 2002).

According to Response Styles Theory, distraction is a coping mechanism that helps individuals to distract themselves from negative thoughts (Nolen-Hoeksema, 1991). According to Nolen-Hoeksema and colleagues (2008) studies of distraction have been mixed, with some results indicating that distraction has adaptive qualities while others have indicated distraction has maladaptive qualities. These questions continue to be explored. Methods to increase use of adaptive forms of distraction as a form of treatment to address brooding should continue to be examined in future research.

In the design of the present study, attachment avoidance was not included because there was no research to suggest that attachment avoidance may be linked to greater rumination. However, attachment avoidance may be an important consideration in future studies that examine distraction considering that attachment avoidance has been theorized to be linked to minimizing strategies.

Rumination as a mediator of attachment anxiety and forms of distress other than anxiety and depression should also be examined in the future; for example, bulimia and substance abuse have previously been linked to rumination (Nolen-Hoeksema, Stice,
Wade, & Bohon, 2007). Examination of the role of rumination in other symptoms, such as binge eating disorder and anorexia, should also be examined in future studies.

Rumination has been shown to impact relationships with others (Benazon & Coyne, 2000; Schwartz & MacCombs-Thomas, 1995). Recently the impact of rumination on therapeutic alliance has been examined (Teismann, Michalak, Willutzki, & Schulte, 2012). Results of the study by Teismann et al. indicated that rumination did not influence the therapeutic alliance. The authors, however, did find that therapists rated the therapeutic alliance higher compared to clients and viewed clients as more receptive to therapeutic techniques among individuals who used distraction in response to a depressed mood as opposed to rumination. It would be interesting to continue to examine the impact of brooding rumination on therapist and the counseling process.

Recent research has shown that rumination is a factor in the co-occurrence of anxiety and depression (McLaughlin & Nolen-Hoeksema, 2011). This study, which found rumination to relate to anxiety and depression, was conducted while examining rumination as a transdiagnostic factor in depression and anxiety (McLaughlin & Nolen-Hoeksema, 2011). The authors found that depressive symptoms may contribute to increased rumination which then contributes to the development of anxiety. They concluded that the reciprocal process between anxiety and depression was also true. The results of the study suggest that rumination is an important factor in the co-occurrence of anxiety and depression. Given that research has shown anxiety and depression to be co-morbid (Hirschfeld, 2001), future research should continue to address this area.

In sum, the results of the present study support a model in which attachment anxiety leads to the hyperactivating strategy of brooding rumination, which in turn leads
to increased symptoms, including both depressive and anxiety symptoms. Some research has begun to examine treatments that reduce rumination, but there is still much to learn about other possible mechanisms that may link attachment anxiety to higher levels of psychological symptoms. Nevertheless, the present study replicates previous research on rumination as mediator of the link between attachment anxiety and depressive symptoms. Additionally, the present study supports the notion that brooding rumination serves as a mediator of the association between attachment anxiety and anxiety symptoms. Results of the present study provide support for brooding rumination as at least one potential explanatory mechanism for the link between attachment anxiety and symptoms observed in previous research (Mikulincer & Shaver, 2007; Mallinckrodt & Wei, 2005; Wei, Heppner & Mallinckrodt, 2003). The present study represents an advance in the science by extending previous research to include an explanatory mechanism for anxiety symptoms, as well as depressive symptoms.
REFERENCES


48, 1184-1199.


York: Basic Books.


Mikulincer, M., & Shaver, P. R. (2003). The attachment behavioral system in adulthood:
Activation, psychodynamics, and interpersonal process. In M. P. Zanna (Ed.),
Advances in experimental social psychology (Vol. 35, pp. 53-152). San Diego,
CA: Academic Press.

Mikulincer, M., & Shaver, P. R. (2004). Security-based self-representations in adult-
hood: Contents and processes. In W. S. Rholes & J. A. Simpson (Eds.), Adult
attachment: Theory, research, and clinical implications (pp. 159-195). New
York: Guilford Press.

Mikulincer, M., & Shaver, P. R. (2007). Attachment in adulthood: Structure, dynamics,
and change. New York: Guilford Press.

regulation: the dynamics, development, and cognitive consequences of

Mikulincer, M., Shaver, P. R., Rholes, S.W., & Simpson, J.A. (2004). Security-Based
Self- Representations in Adulthood: Contents and Processes. Adult attachment:
Theory, research, and clinical implications. (pp. 159-195). New York, NY, US:
Guilford Publications.

Mallinckrodt, B., & Wei, M. (2005). Attachment, social competencies, social support,

of depressive episodes. Journal of Abnormal Psychology, 100, 569-582.


Wei, M., Mallinckrodt, B., Russell, D. W. & Abraham, W. T. (2004). Maladaptive perfectionism as a mediator and moderator between adult attachment and


APPENDIX A
Participant Demographic Form

Age

_____ Years

Gender

_____ Female

_____ Male

_____ Trans Woman (MTF)

_____ Trans Male (FTM)

Sexual orientation

_____ Heterosexual

_____ Gay

_____ Lesbian

_____ Bisexual

_____ Queer

_____ Other: _________________________________

_____ Don’t know or not sure

Year in School

_____ Freshman

_____ Sophomore

_____ Junior

_____ Senior

_____ Graduate Student

_____ Other
Race (check all that apply)

_____Black/African American
_____Asian/Asian American/Pacific Islander
_____White/European American
_____Hispanic/Latino/a
_____Chinese
_____Asian Indian
_____Other Asian
_____American Indian or Alaska Native
_____Other (please specify__________________)

Please specify your current religious/spiritual denomination/affiliation: ___

___Christian
___Jewish
___Muslim/Islam
___Hindu
___Buddhist
___Spiritual/non-religious
___Agnostic
___Atheist
___Other

I was involved in a romantic relationship for at least 3 months that ended in the past 12 months.

_____Yes

_____No
APPENDIX B

Experiences in Close Relationship Scale-Short Form (ECR-S)

Wei, Russell, Mallinckrodt, & Vogel (2007)

Instructions: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Write the number in the space provided, using the following rating scale:

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Neutral/</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly</td>
<td>Mixed</td>
<td>Strongly</td>
</tr>
</tbody>
</table>

1. I worry that romantic partners won't care about me as much as I care about them.

2. I want to get close to my partner, but I keep pulling back.

3. I am nervous when partners get too close to me.

4. My desire to be very close sometimes scares people away.

5. I try to avoid getting too close to my partner.

6. I need a lot of reassurance that I am loved by my partner.

7. I do not often worry about being abandoned.

8. I find that my partner(s) don't want to get as close as I would like.

9. I usually discuss my problems and concerns with my partner.

10. I get frustrated if romantic partners are not available when I need them.

11. It helps to turn to my romantic partner in times of need.

12. I turn to my partner for many things, including comfort and reassurance.
APPENDIX C

Ruminative Responses Scale (RRS)


*Instructions:* People think and do many different things when they feel sad, blue, or depressed. After reading the following items, use the scale to indicate if 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.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

1. Think “What am I doing to deserve this?”
2. Think “Why do I always react this way?”
3. Think about a recent situation, wishing it had gone better.
4. Think “Why do I have problems other people don’t have?”
5. Think “Why can’t I handle things better?”
APPENDIX D

Center for Epidemiological Studies Depression Scale (CES-D)

Radloff (1977)

*Instructions:* Below is a list of ways you might have felt or behaved. Please indicate how often you have felt this way during the past week. Rate each item 1-4 using the scale provided.

1 - Rarely or none of the time (less than 1 day)
2 - Some or a little of the time (1-2 days)
3 - Occasionally or a moderate amount of time (3-4 days)
4 - Most or all of the time (5-7 days)

**During the past week:**

_____ 1. I was bothered by things that usually don’t bother me.

_____ 2. I did not feel like eating; my appetite was poor.

_____ 3. I felt that I could not shake off the blues even with help from my family or friends.

_____ 4. I felt that I was just as good as other people.

_____ 5. I had trouble keeping my mind on what I was doing.

_____ 6. I felt depressed.

_____ 7. I felt that everything I did was an effort.

_____ 8. I felt hopeful about the future.

_____ 9. I thought my life had been a failure.

_____ 10. I felt fearful.

_____ 11. My sleep was restless.
12. I was happy.
13. I talked less than usual.
15. People were unfriendly.
16. I enjoyed life.
17. I had crying spells.
18. I felt sad.
19. I felt that people dislike me.
20. I could not get “going.”
APPENDIX E

State-Trait Anxiety Inventory-Trait

Spielberger, Gorsuch, Lushene, Vagg, & Jacobs (1983)

(Sample items only due to copyright restrictions)

Instructions: The following statements have been used by individuals to describe how they generally feel. Read each statement and rate the degree to which you agree with each statement in general using the 4-point rating scale provided. There are no right or wrong answers.

<p>| | | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>almost never</td>
<td>sometimes</td>
<td>often</td>
<td>almost always</td>
</tr>
</tbody>
</table>

___1. I feel pleasant
___2. I feel nervous and restless
___3. I feel satisfied with myself
___4. I wish I could be as happy as others seem to be
___5. I feel like a failure
APPENDIX F

State-Trait Anxiety Inventory-State

Spielberger, Gorsuch, Lushene, Vagg, & Jacobs (1983)

(Sample items only due to copyright restrictions)

Instructions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1  2  3  4
not at all  somewhat  moderately so  very much so

___1. I feel calm

___2. I feel tense

___3. I feel strained

___4. I am presently worrying over possible misfortunes

___5. I feel frightened
APPENDIX G

Recruitment

Subject: Invitation to participate in a research study

Greetings students!

My name is Marie Land and I am a doctoral student at The Pennsylvania State University in the Department of Counselor Education, Counseling Psychology, and Rehabilitation Services. I am looking for students to take a few minutes to answer an online survey. The purpose of this study is to learn more about relationship styles, thinking patterns, and symptoms of distress.

The results of this study may be very important in understanding how to provide better treatment for university age undergraduate and graduate students. I understand how valuable your time is as a student. Therefore, this survey can be easily completed in approximately 15 minutes online at the link provided below.

Further, an email will be sent to you within 72 hours containing a

$5 amazon.com gift card!

I greatly appreciate your participation in this dissertation research study and would be happy to send you the results upon completion. If you have any questions, please email me at mll256@psu.edu. Dr. Susan Woodhouse is supervising this study. You may also contact her with any questions or concerns at ssw10@psu.edu. This study has been approved by the Penn State Social Science Institutional Review Board (IRB#36842).

If you’re interested in participating please go to the link below and you will be transferred to my website. Once there, follow the instructions to start the survey.

www.psycdata.com/s.asp?SID=142376
APPENDIX H

Subject: Follow-up: Invitation to participate in a research study

Greetings students!

My name is Marie Land and I am a doctoral student at The Pennsylvania State University in the Department of Counselor Education, Counseling Psychology, and Rehabilitation Services. A couple of weeks ago you received an email inviting you to participate in a research study. The purpose of this study is to learn more about relationship styles, thinking patterns, and symptoms of distress. I greatly appreciate those of you who have taken the time and effort to participate in the study!

If you would still like to participate and have not had the opportunity to do so yet, the survey can be completed in approximately 15 minutes online at the link provided below.

As a reminder, after completion of the survey an email will be sent to you within 72 hours containing a

$5 amazon.com gift card!

If you are female and between the age of 18-30 and are interested in participating please go to the link below and you will be transferred to my website.

https://www.psychdata.com/s.asp?SID=142376
APPENDIX I

Implied Informed Consent Form for Social Science Research
The Pennsylvania State University

Title of Project: Factors related to Psychological Distress

Principal Investigator: Marie Land, Graduate Student
327 CEDAR Building
University Park, PA 16802
(617) 304-7261; mli256@psu.edu

Advisor: Dr. Susan Woodhouse
313 CEDAR Building
University Park, PA 16802
(814) 863-5726; ssw10@psu.edu

Other Investigator(s): None

Purpose of the Study: The purpose of this research study is to examine relationship styles, thinking patterns, and symptoms of distress

1. Procedures to be followed: You will be asked to answer 57 questions on an online survey using numerical rating scales.

2. Discomforts and Risks: There are no expected risks in participating in this research beyond those experienced in everyday life. However, some of the questions are personal and might cause discomfort.

3. Benefits: You might learn more about yourself by participating in this study. You might have a better understanding of your relationship styles, thinking patterns, and the symptoms of distress. This research might provide a better understanding of how to treat university students experiencing distress. This research could help clinicians and researchers with designing interventions to psychological distress.

4. Duration/Time: It will take approximately 15 minutes to complete the survey.

5. Statement of Confidentiality: Your participation in this research is confidential. The survey does not ask for any information that would identify who the responses belong to. Penn State’s Office for Research Protections, the Social Science Institutional Review Board and the Office for Human Research Protections in the Department of Health and Human Services may review records related to this...
research study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared because your name is in no way linked to your responses.

6. Your confidentiality will be kept to the degree permitted by the technology used. No guarantees can be made regarding the inception of data sent via the Internet by any third parties.

7. **Right to Ask Questions:** Please contact Marie Land via email at mll256@psu.edu or by phone at (617) 304-7261 with questions, complaints or concerns about this research, including if you feel this study has harmed you in any way. You may also contact the project supervisor, Dr. Susan Woodhouse at ssw10@psu.edu. Questions about your rights as a research participant may be directed to Penn State University’s Office for Research Protections at (814) 865-1775. You may also call this number if you cannot reach the research team or wish to talk to someone else.

8. If you find that you are experiencing psychological distress, or feel you are in crisis, call the National Suicide Prevention Lifeline 1-800-273-TALK (8255)

9. **Payment for participation:** At the end of the survey, you will be asked to submit your email address in order to receive an amazon.com gift card for $5. You will receive the gift card within 72 hours of completing the surveys.

10. **Voluntary Participation:** Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer. Refusal to take part in or withdrawing from this study will involve no penalty or loss of benefits you would receive otherwise.

11. You must be between the ages of 18 and 65 to take part in this research study. You must be currently enrolled as an undergraduate or graduate student at a university.

12. Completion of the online survey implies that you have read the information in this form and consent to take part in the research. Please print this form for your records or future reference.
EDUCATION

PhD Counseling Psychology, The Pennsylvania State University, University Park, PA August 2012
M.A. Boston College, 2007
Counseling Psychology with a concentration in
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B.S. University of New Orleans, 2004 Psychology

WORK EXPERIENCE

Pre-doctoral intern in professional psychology, August 2011- August 2012
Counseling and Psychological Services, The Pennsylvania State University
Graduate Assistant, August 2009-May 2011
Counseling and Psychological Services, The Pennsylvania State University

PUBLICATIONS


PRESENTATIONS


Brown, C. L., Land, M., Terry, L. (2012) You can’t just ‘defriend’ me: Interpersonal conflict in group psychotherapy. Presented at the Big Ten Counseling Center Conference, Indiana University, Bloomington IN.