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Is Rumination General or Specific to Negative Mood States? The Relationship between Rumination and Distraction and Depressed, Anxious, and Angry Moods in Women

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Is Rumination General or Specific to Negative Mood States?

The Relationship between Rumination and Distraction
and Depressed, Anxious, and Angry Moods in Women

by

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A DISSERTATION

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Acknowledgments

I am grateful to have this opportunity to publicly recognize various individuals whom have positively impacted my life. As the old cliché goes, life is a journey, and luckily I have not had to make too many trips alone. Graduate school was full of tumultuous moments and there were countless times I wondered if I would ever finish. Due to my own willpower and others' encouragement and support, I am happy to be able to look back now and tell myself, "It wasn't that bad." Or perhaps more accurately, what does not kill us makes us stronger.

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Abstract

Rumination has been found to play a role in negative affect by either maintaining or increasing depressive, anxious, and angry moods, whereas distraction has been found to decrease these negative moods. This experiment tested the hypothesis that the effect of rumination occurs across mood states and is not specific to one type of negative mood, using both Nolen-Hoeksema's Response Styles Theory (RST; 1991), and Bower's Associative Network Theory (1981; ANT). The impact of rumination and distraction on depressed, anxious, and angry mood states were examined in 90 women at the University of Missouri – St. Louis. Participants were randomly placed in 1 of 3 mood inductions (depressed, anxious, or angry), and in either a rumination or distraction response task. Mood was assessed using the Profile of Mood Scales, Brief Form (POMS-B; McNair, Lorr, & Droppleman, 1992) at 3 times; baseline, post-mood induction, and post-response task. Consistent with Bower's ANT (1981), repeated measures multivariate analyses of variance showed that all negative moods increased following the negative mood induction, regardless of the particular mood induced. However, the data did not fully support Nolan-Hoeksema's RST (1991); negative mood did not increase following the rumination task, but instead decreased. Following the distraction task, mood was significantly lower than at baseline, suggesting that distraction appeared to have some positive induction qualities. Overall, these findings support Bower's ANT and offer only partial support for Nolen-Hoeksema's RST; potential alternative explanations for the results are discussed.

Is Rumination General or Specific to Negative Mood States?

The Relationship between Rumination and Distraction and Depressed, Anxious, and Angry Moods in Women

Rumination is a relatively new construct that began to receive extensive attention in the 1990s. The majority of research on rumination has been conducted to help explain the causes and consequences of depressed mood, as well as the gender differences found in clinical depression. Some investigators have begun to examine rumination in relation to anxious mood; however, more research has been conducted in relation to comorbid depressed and anxious moods. When examining negative mood states, rumination has also been found to be related to anger. Although rumination has received attention in the literature over the past decade, it is not clear whether rumination affects multiple negative mood states concurrently. Thus, the purpose of this research was to test the hypothesis that rumination is more generally linked to negative mood states, rather than specifically linked to depressed mood. Before reviewing any of the literature, it is important to first explain the concept of rumination and its significance in the study of mood disorders.

Overview of Conceptual Issues in the Study of Rumination

Ruminations have been defined as intrusive and repetitive thoughts that occur when there is nothing else people can do to overcome discrepancies between reality and alternative states, between what is and what might be or could have been (Wanke & Schmid, 1996). Ruminating may occur when there is no control over a loss, when one fails to achieve important personal goals, when an individual is presented with something new that takes hold of her or his thoughts and causes trouble focusing, or when it is perceived that one's social support network is no longer interested in listening to problems (King & Pennebaker, 1996; Papageorgiou & Wells,

2001b). Individuals may also begin to ruminate when they negatively appraise their thoughts, mood, behaviors, life situations, stressors, and ability to cope (Papageorgiou & Wells, 2001b). Moreover, ruminating is believed to occur when progress toward a goal is either slower than expected or unattainable (Martin & Tesser, 1996). Rumination in this context is defined as thoughts that are conscious, recurrent, and not demanded by the immediate environment. People ruminate until they have either attained a goal or given up on it. These definitions of rumination are quite global in nature and focus more on the context than the content of ruminative thoughts. This has led to the increasing attention in the literature to a more specific definition, proposed by Nolen-Hoeksema (1991).

The greatest volume of research in the area of rumination emanates from Nolen-Hoeksema's Response Styles Theory (RST; 1991), the conceptual model most often cited in the rumination literature. In this theory, Nolen-Hoeksema (1991; 1996; 1998b) defines rumination as the passive and repetitive focus on one's symptoms of distress and on all the possible causes and consequences of those symptoms without taking action to correct the problems identified. Nolen-Hoeksema's (1991) RST posits that an individual's tendency to respond to minor negative moods with rumination will lead to longer and more severe negative moods. The key feature of rumination is "repetition of a theme in thoughts, without progression toward choice of a solution and a commitment to that solution" (Nolen-Hoeksema, 1996, pp. 136-137). In RST, the process of rumination begins for individuals after an awareness of symptoms of distress. The distress could be behavioral (e.g., "I can't get out of bed"), somatic (e.g., "My stomach hurts"), cognitive (e.g., "I can't concentrate"), and/or emotional (e.g., "I feel so upset"). This awareness of distress is followed by attempts to identify all of the causes and consequences of the distress. Thus, a cycle begins in which a person feels badly, and then seeks to understand why by focusing on his

or her distress, which leads to an exacerbation of negative affect, followed by more intense self-examination. Hence, the person becomes stuck in a cycle of negative affect, focusing on causes and consequences, without seeking a solution to his or her problems.

Nolen-Hoeksema's explanation of how rumination occurs is very specific and follows Bower's (1981) Associative Network Theory (ANT). According to Bower, each emotion (e.g., anger, sadness, fear, joy) is represented by a particular node in memory that has a set of features associated with the emotion. Once this emotion node is activated, cognitions and memories are recycled through the individual's cognitive networks, thereby maintaining the emotion. The activation of a primary node can also activate secondary nodes, thus spreading through the associated network. Information consistent with the content of an individual's active network will likely receive cognitive elaboration, whereas contrary or irrelevant information is likely to be discarded. Rumination involves the bias of attending to the negative, emotional aspect of information faster than the positive aspects, which may even be ignored (Siegle, Ingram, & Matt, 2002). Hence, when an individual focuses on information relevant to a negative mood, the emotions are maintained, making the negative affect difficult to deactivate. The same is true when positive nodes are activated. Affect can certainly change based on new information received, but only if the new information activates memories and emotion nodes that are stronger than the current mood. For example, a student may be happy after passing a test, but may quickly become upset later that day when finding out that his or her beloved childhood pet died. This new information primes memories and activates emotion nodes that are stronger than the happy feeling of passing a test. An implication of ANT is that for individuals who habitually ruminate, the activation of a negative emotion node leads to a focus on negative internal and external information that matches this mood.

Characteristics of Habitual Ruminators

The study of ruminative processes is important, as a number of negative characteristics have been found to be associated with chronic rumination. Those who habitually ruminate (“ruminators”) tend to have a history of past clinical depression and are more likely to report severe depressive symptoms than nonruminators (Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Nolen-Hoeksema, Parker, & Larson, 1994). Ruminators are typically more self-critical and self-blaming when focusing on their personal problems (Lyubomirsky et al., 1999). Ruminators also tend to be more dependent upon others and report reduced self-confidence and a perceived loss of control (Lyubomirsky et al., 1999; Nolen-Hoeksema & Davis, 1999; Spasojevic & Alloy, 2001). Moreover, ruminators reportedly believe their life stressors are more difficult than nonruminators (Nolen-Hoeksema et al., 1994). A higher frequency of ruminating has also been associated with a greater need to understand a situation and the personal importance of the situation (Watkins, 2004). Habitual ruminations are associated with increased cognitive distortions, cognitive inflexibility, pessimistic thinking, difficulty solving problems, and poor sleep quality (Anderson & Limpert, 2001; Davis & Nolen-Hoeksema, 2000; Donaldson & Lam, 2004; Ingram, Miranda, & Segal, 1998; Lyubomirsky et al., 1999; Mor & Winquist, 2002; Thomsen, Mehlsen, Christensen, & Zachariae, 2003). International researchers in Japan found similar results; ruminators were more likely to have a pessimistic outlook, negative cognitive style, and worse mental adjustment after a six-month period compared to nonruminators (Nagura & Hashimoto, 1999).

Gender differences have also been associated with rumination. In numerous studies of varying ethnic backgrounds, girls and women were more likely than boys and men to report that they engaged in ruminating when distressed (Allgood-Merten, Lewinsohn, & Hops, 1990;

Blachard-Fields et al., 1991; Grant et al., 2004; Nolen-Hoeksema & Jackson, 2001; Nolen-Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema et al., 1994). Although women are more likely than men to ruminate when depressed or anxious, this has not necessarily been found with anger. When given the choice, women preferred to distract themselves from their angry feelings, whereas men did not seem to show a preference to ruminate or distract from their anger (Rusting & Nolen-Hoeksema, 1998).

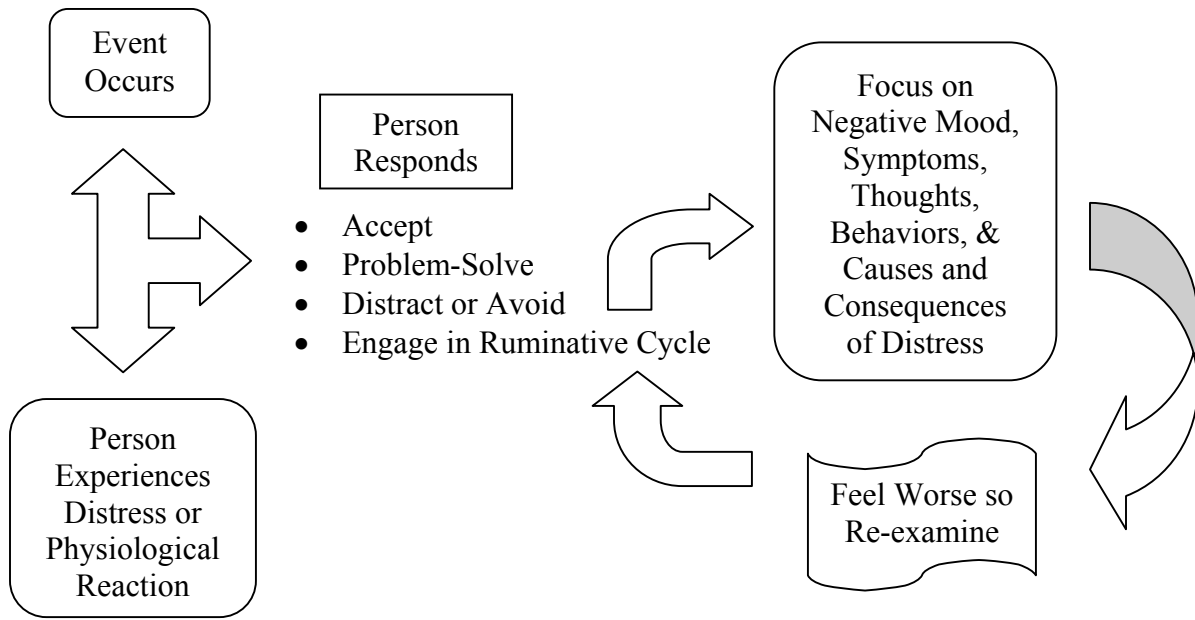
Ruminators have self-reported negative consequences of ruminating such as being unable to control their ruminations and becoming angrier, both of which have led to interpersonal and social problems (Papageorgiou & Wells, 2001a; Simpson & Papageorgiou, 2003). Accordingly, chronic rumination is problematic because it is persistent and interferes with daily functioning, instrumental behavior, and problem solving, among other things. Despite this list of negative correlates of habitually ruminating, frequent ruminators have reported that they ruminate for a number of reasons and also hold positive beliefs about ruminating. Ruminators reported that they viewed rumination as a helpful coping strategy and believed they were increasing self-awareness and understanding of their negative mood state, solving problems, preventing future mistakes, and gaining insight (Lyubomirsky & Nolen-Hoeksema, 1993; Papageorgiou & Wells, 2001a; Simpson & Papageorgiou, 2003; Watkins & Baracaia, 2001). Ruminators have also rated themselves as more aware of their own personalities, their life situation, and even how the world works compared to nonruminators (Nolen-Hoeksema, 1998a). Thus, ruminators appear to be more self-reflective than nonruminators; however, the focus tends to be negative.

The Ruminative Cycle

It should be noted that the study of rumination may be linked to, and may have even developed from research in areas such as self-focused attention and automatic negative thoughts;

however, the hypothesized cognitive process is not the same. According to RST, ruminators become stuck in a cycle in which they are examining their symptoms, mood, thoughts, and behavior. That is, ruminations are typically seen as a purposeful examination and not automatic thoughts. Further, self-focused attention or self-reflective thinking is also different from ruminations. Individuals can engage in thoughts about themselves without initiating a negative cycle of rumination. In fact, it is helpful for individuals to spend time thinking about their problems in order to figure out resolutions and be more prepared for future similar situations. This may be a form of active problem solving and/or reflection. Individuals can learn from such a process, which is very different from a ruminative process that does not seem to reflect learning or problem solving.

In the case of habitual ruminating, self-examination is not a typical wondering about what the person's role was in a situation and what could be done in the present or perhaps in a future similar situation. Instead, high frequency ruminators repeatedly examine the negative aspects of themselves as well as all of the possible causes and consequences of their distress. Even if habitual ruminators comprehend why something happened, this insight does not lead to problem solving and/or behavioral change. Instead, negative self-examination and mentally replaying negative events and interactions makes chronic ruminators feel worse, so they re-examine why they feel badly, and the cycle continues. A diagram of the ruminative cycle follows. Note that the process of rumination may begin after an event occurs and/or the person experiences a physiological reaction or distress. As shown in the diagram, the cycle of rumination is just one of many possible ways to respond to distress.



Thus, rumination investigators tend to agree that ruminations are recurrent, repetitive thoughts that focus on something negative and are reflected in a cycle of negative thinking and mood (Blagden & Craske, 1996; Mor & Winquist, 2002; Nolen-Hoeksema, 1996; Segerstrom, Tsao, Alden, & Craske, 2000; Siegle et al., 2002). The majority of rumination investigators who study depression do so according to Response Styles Theory of Depression. Therefore, this theory will now be explained, as well as the research findings.

Rumination and Depressed Mood

Response Styles Theory of Depression

The Response Styles Theory was originally proposed to account for the gender differences seen in clinical depression and depressed mood (Nolen-Hoeksema, 1991). Numerous studies have found that men and women respond differently to depressed mood (Ingram, Miranda, & Segal, 1998). Nolen-Hoeksema posited that rumination was the key, particularly because gender differences have also been found in rumination. In self-report, observational, and experimental studies, women have been found to be more likely than men to use a

ruminative style of coping with depressive symptoms, whereas men have typically chosen to use some form of distraction (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema et al., 1993; 1994; 1999; Nolen-Hoeksema & Jackson, 2001; Roberts et al., 1998).

In the Response Styles Theory, rumination is thought to exacerbate and prolong periods of depressed mood through three mechanisms (Nolen-Hoeksema, 1991; 1998a). First, rumination enhances the negative effects of depressed mood on thinking by making depressive interpretations of negative events and memories more accessible and therefore, more likely to continue. This is similar to, and follows Bower's (1981) Associative Network Theory that has already been explained. Second, rumination is viewed to increase pessimistic, distorted thinking, which interferes with complex interpersonal problem solving skills. Problems remain when problem solving is interfered with, and thus, depressed mood is maintained. Third, rumination is seen to inhibit people from engaging in everyday instrumental behaviors and pleasant activities that could enhance their sense of control and decrease their depressed mood (Nolen-Hoeksema, 1991; 1998a).

How an individual reacts to an event depends upon many factors, including previous experience in a similar situation, learned coping skills, his or her biological response to stressors, current stressors and/or demands, and perceived social support. An individual can respond in a number of ways, behaviorally and cognitively, including accepting the situation, problem solving and attempting to find a solution, engaging in distraction or avoidance coping, or initiating the cyclical process of rumination. Depending on the situation and how the person chooses to respond, these responses could be helpful or harmful. Specifically, problem solving is helpful, whereas ruminating is harmful. However, distracting behaviors vary, as do the reasons people distract. For some people, it may be helpful to distract oneself initially to decrease the intensity

of the mood, and then examine one's feelings and problems when more calm. This form of distraction is a positive coping skill and examples include exercising, listening to music, and watching television. Although both men and women use distraction, men seem to do so in a more harmful manner. That is, men are more likely than women to distract by engaging in dangerous behaviors, such as driving recklessly, abusing substances, behaving violently, and engaging in criminal behavior (Averill, 1983; Hogan & Linden, 2004; Thomas, 2002). These types of distraction can have negative consequences. Such behavior may result when people only distract themselves and deny their problems.

In experimental rumination studies, a distraction condition typically serves as the contrast condition to the rumination condition. Distraction has been defined in the rumination literature as the "purposeful turning of one's attention away from one's symptoms...onto pleasant or neutral activities" (Nolen-Hoeksema, 1998a, p. 239). Distraction is believed to alleviate negative mood and is therefore, different from rumination.

Empirical Support for Response Styles Theory

The effect of rumination and distraction on depressive symptoms has been examined in a number of experimental studies. A short rumination task either maintained or increased a depressed mood in individuals who reported symptoms of dysphoria, whereas a short distraction task decreased depressed mood similar to levels seen in nondysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Nolen-Hoeksema & Morrow, 1993; Vickers & Vogeltanz-Holm, 2003). Although these experimental studies had participants engage in either the rumination or distraction task for only eight minutes, it was long enough to temporarily affect their beliefs, mood, and behavior. However, in these studies the rumination and distraction tasks had no effect on nondepressed participants. Other studies have found different results.

Trask and Sigmon (1999) had nondepressed college students engage in two separate, but sequential tasks after engaging in a mood induction. Participants in the rumination task condition reported significantly more depressed mood following the mood induction than those in the distraction task condition, who reported a decrease in depressed mood. Not surprisingly, participants placed in a rumination task followed by another rumination task reported significantly more depressed mood than other participants. As expected, participants who first ruminated and then distracted exhibited an increase in depressed mood following the rumination task, but the mood was significantly decreased after the distraction task. Moreover, participants who first distracted and then were made to ruminate reported decreased depressed mood following distraction, and the mood did not increase after the rumination task. These results further suggest that it may be important for individuals to initially distract themselves from a depressed mood in order to get some perspective, instead of concentrating on their negative feelings and initiating a ruminative process.

Rumination has also been studied with regard to pleasant activities, insight, personal characteristics, problem solving, and future events in college students (Lyubomirsky & Nolen-Hoeksema, 1993; 1995). Compared to dysphoric distracters, dysphoric ruminators were more pessimistic about their futures, made more self-defeating attributions about hypothetical negative events and chose more depressed and/or distorted interpretations of the events. Further, dysphoric ruminators were poor problem solvers, gave poorer quality solutions to hypothetical interpersonal problems and made more pessimistic attributions for the problems. Ruminators also reported that they were unlikely to engage in pleasant activities that they had designated were enjoyable. Moreover, individuals indicated that they were more insightful when ruminating, even though it made them feel worse. Interestingly, dysphoric individuals who

distracted instead of ruminating did not report such negativity, and instead reported beliefs, thoughts, and skills similar to nondypshoric individuals.

To help explain individual differences in rumination and the duration and severity of depressive symptoms, four longitudinal, correlational studies were conducted in various populations (Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1993; 1994). In a diary study, general psychology college students (N = 79) recorded their moods and their responses to those moods, as well as personal events, every day for one month (Nolen-Hoeksema et al., 1993). After coding the diaries, Nolen-Hoeksema and colleagues (1993) found that 83 percent of participants were consistent in choosing either a ruminative or a distracting style of responding to depressed symptoms. Those with a ruminative style had longer periods of depressed mood, even after the severity of their baseline moods was statistically controlled. The results were the same in an earthquake study; college students with a more ruminative style of responding to depression before the natural disaster were more depressed after the disaster (Nolen-Hoeksema & Morrow, 1991). Lastly, the same held true in two bereavement studies; community members with a ruminative style of responding to depression one month following their loss tended to be more depressed six months later (Nolen-Hoeksema et al., 1994; 1997).

As ruminating has been found to increase depressed mood and depressive symptoms, it has also helped to predict depressive episodes and chronicity in an initially nondepressed sample. Just and Alloy (1997) found that college students who reported that they ruminated in response to depressive symptoms were more likely to suffer a depressive episode over 18 months than those who reported that they typically distracted themselves when experiencing depressive symptoms. Further, participants who reported that they engaged in more rumination when in a

depressed mood had a more severe episode than those who engaged in less rumination when feeling depressed. Similarly, international investigators in Germany found that more ruminative responses were indicative of greater depression and also predicted episode chronicity in a clinical population after controlling for baseline levels of depression (Kuehner & Weber, 1999).

Researchers in Japan found that rumination was more closely related to the severity of depressive episodes than other vulnerabilities to depression, such as perfectionism and attribution style (Ito, Takenaka, & Agari, 2001).

The studies presented here offer support for the Response Styles Theory of depression. Investigators who questioned the theory have also found support for RST (Strauss, Muday, McNall, & Wong, 1997). In sum, for individuals who report symptoms of dysphoria, a short rumination task can either maintain or increase a depressed mood state, and a short distraction task can decrease depressed mood to levels seen in nondysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Nolen-Hoeksema & Morrow, 1993; Vickers & Vogeltanz-Holm, 2003). There is also evidence that ruminating is associated with depressed mood and that ruminating can increase the severity and duration of a clinical episode of depression (Just & Alloy, 1997; Kuehner & Weber, 1999). Another area of research that is just beginning to garner attention is the role that frequent and habitual rumination plays in anxious mood.

Rumination and Anxious Mood

Similar to findings in depression studies, ruminations have been found to increase anxiety, causing poor problem solving and performance on tasks, as well as negative biases in judgment and memory (Mellings & Alden, 2000; Szabo & Lovibon, 2002; Thompson et al., 2002). Results from a diary study of introductory psychology students revealed that 11% of written thoughts could be categorized as ruminative (Szabo & Lovibond, 2002). Ruminations,

defined in this study as recurrent thoughts of negative aspects of the present or past situation or of other people, were also associated with fewer reports of successful problem solving, similar to findings in studies of depression.

As with problem solving, performance and persistence on tasks can vary with ruminative thinking and negative affect. The effects of worry and rumination on performance and persistence were examined by manipulating performance feedback of tasks to college students. Worriers who were told they had failed on the first task showed poorer performance, elevated anxiety, and greater rumination than nonworriers on a second task (Thompson, Webber, & Montgomery, 2002).

Rumination has not only been found to decrease performance, but was also found to predict negative recall in socially anxious undergraduate psychology students (N=58) who reported more rumination compared to their non-socially anxious experimental partners the day after a ten-minute one-on-one social interaction (Mellings & Alden, 2000). Interestingly, the reported frequency of ruminative thoughts by the socially anxious participants predicted recall of negative self-related information and was associated with biases in judgment and a distorted memory of the interaction. The researchers (Mellings & Alden, 2000) concluded that ruminating might have perpetuated the existing cognitive biases that the socially phobic individuals possessed, contributing to a prejudice in recall that favored negative self-related information. This follows Bower's Associative Network Theory in that the event of the social interaction primed negative cognitions and memories.

Rumination in Comorbid Depressed and Anxious Mood

There are no studies in the literature that specifically examine the presence of chronic rumination in individuals with comorbid depression and anxiety disorders. However, due to the

high comorbidity of depressive and anxiety disorders, investigators have examined rumination in relation to these two co-existing mood states. Depressed mood can include “feeling sad, unhappy, hopeless, worthless, and incompetent” (Worell & Remer, 2003, p. 152). Anxious mood consists of excessive, uncontrollable worry (Pigott, 2002). Rumination has been associated with both depressive and anxious moods, even among people who reported low levels of these symptoms. Harrington and Blankenship (2002) found a significant correlation between rumination and depression in a group of minimally to mildly depressed participants, as well as a moderate correlation between rumination and anxiety. Similarly, rumination has been found to be significantly related to depressed, anxious, and angry moods (Thomsen et al., 2003). After controlling for the other two moods, only depressed and angry moods were independently related to rumination, whereas anxious mood was not significantly related to rumination after controlling for angry and depressed moods. However, the association between rumination and depressed and angry mood was weaker when the moods were analyzed independently, suggesting a spreading of activation through the emotion nodes. The investigators concluded that anxiety might be activated secondarily, after activation of the sadness and anger emotional nodes. Until more research is conducted, this conclusion cannot be confirmed.

Additionally, negative affect has been associated with self-focus (Wood et al., 1990). Participants who tended to be highly self-focused were more likely to ruminate about a problem or event. Participants who ruminated about their problems reported more depressed and anxious mood, whereas those who engaged in direct action (e.g., generating solutions or actively doing something about a problem) reported less depressed mood. The most successful strategies reported for reducing tension, anxiety, and depressed mood were attempting to distract oneself from negative mood by engaging in activities such as exercising and listening to music (Thayer,

Newman, & McClain, 1994). Men reported they were more likely to use these strategies than women, and women reported that they were more likely to use more ruminative strategies, such as discussing the emotion-provoking event with others. However, it should be noted that discussing problems with others could be a helpful strategy for alleviating negative moods. That is, talking about a problem is not rumination unless the problem is repetitively discussed without seeking resolution and consequently, complicates matters further, such as by interfering with daily functioning and/or causing problems in one's social network.

To examine how the response style theory of depression extends to anxiety, anxious mood was induced in nondepressed college students (Blagden & Craske, 1996). Participants were then randomly assigned to engage in either a rumination or a distraction task, in which they read 44 index cards for ten minutes. The rumination cards focused on participants' current feelings and personal characteristics, whereas the distraction cards focused on geographical locations and objects. Participants were told they were participating in a series of unrelated tasks on thinking and imagination. Participants completed the Profile of Mood States Scale (McNair, Lorr, & Droppleman, 1992) at baseline, post-mood induction, and post-experimental task. Blagden and Craske (1996) found that anxious mood decreased after the distraction task, but remained relatively stable after the rumination manipulation. The same pattern emerged when examining anxious, sad, and angry moods; distraction alleviated negative mood states and rumination maintained such feelings. However, ruminating did not significantly increase anxiety as expected. The investigators wondered whether anxious mood was properly induced because anxious, sad, and angry moods were all elevated by the anxiety induction procedure. Yet, it is logical that inducing one negative mood state would affect other negative mood states, as Bowers' (1981) Associative Network Theory suggests.

Longitudinal studies have also found that rumination plays a role in anxiety and depression. Nolen-Hoeksema (2000) extended her RST to examine whether ruminators were more likely than nonruminators to have depressive disorders, as well as depressive and anxiety symptoms. Given that hopelessness and negative evaluations are central to depression, and uncertainty is essential to anxiety, she posited that ruminators might vacillate between depression and anxiety depending on the content of their thoughts. Nolen-Hoeksema investigated a community sample and found that ruminative responses to distress predicted new onsets of major depression one year later, as well as symptoms of anxiety after controlling baseline symptoms. These results suggest that rumination plays a role in both depression and anxiety. Other longitudinal studies found that individuals with a ruminative coping style showed more prolonged depressed and anxious mood reactions to trauma and stress compared to nonruminators (Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema et al., 1994). Hence, chronic ruminators may be more likely than nonruminators to get caught in cycles of negative thinking about their trauma, which may make it difficult for them to come to some understanding and acceptance of the trauma (Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998).

Thus far, little rumination research has been conducted in regard to only anxiety, but more investigators are beginning to examine rumination in relation to comorbidity of anxiety and depression. As reviewed here, these studies have led to findings that rumination also affects anger. Consequently, anger investigators have recently begun to investigate how rumination affects anger experience and expression.

The Relationship between Rumination and Anger Expression

With regard to managing anger, there are still widely held beliefs that physically or verbally venting (e.g., hitting a pillow or punching bag, yelling at the target of anger) is healthy

and helps to release feelings of anger, and thus positively improves one's psychological state. Yet, according to the Associative Network Theory, the activation of aggressive thoughts produces complex associations consisting of aggressive ideas, emotions related to violence, and the impulse for aggression (Bushman, 2002; Ingram, 1984). Ruminative responses to anger involve a focus of attention on, and the rehearsal of the causes of the anger, as well as a tendency to activate unintentional reoccurring thoughts about anger episodes (Rusting & Nolen-Hoeksema, 1998; Sukhodolsky, Golub, & Cromwell, 2001). Anger is thought to occur as a result of perceived injustice and often involves blame, so ruminating while angry is likely to focus on those thoughts and increase angry feelings, consequently resulting in a vicious cycle (Rusting & Nolen-Hoeksema, 1998). RST suggests that rumination should enhance angry mood and distraction should alleviate angry mood.

Similar to findings in depression and anxiety studies, college students who ruminated after an angry mood induction exhibited an increase in angry feelings, whereas those who distracted themselves did not (Rusting & Nolen-Hoeksema, 1998). Further, participants in the distraction condition were less angry than those in the rumination and control groups. The investigators suggested that perhaps those in the control condition chose to think about their anger since they were not given a specific, non-emotional task to occupy their mind. In an experimental study, the more a college student ruminated about his or her angry feelings, the more aggressive he or she became when given the chance to behaviorally react (Bushman, 2002). This implies that any aggressive behavior performed, even just hitting a pillow, while thinking about one's anger, will not release the negative feelings as previously believed, but instead increase them. As expected, results were consistent with the Associative Network Theory (Bushman, 2002).

Rumination is a new area that is just beginning to gain attention in the anger literature. The few studies published in this area confirm that venting and ruminating only help to promote anger and aggressive behavior (Bushman, 2002; Rusting & Nolen-Hoeksema, 1998). There is a great deal of evidence that chronically experienced anger contributes to risky behavior, such as using drugs and alcohol, and significant health problems, such as high blood pressure and heart conditions (Averill, 1983; Hogan & Linden, 2004; Thomas, 2002). Further, men have been found to be more likely to engage in risky behavior in reaction to anger compared to women. Ruminating regarding the reasons for one's anger has likely played a role in clinical problems associated with anger. Similar to the findings in depression and anxiety, distraction helped to alleviate and decrease angry feelings, at least in short term experiences of anger. So far no studies have been conducted examining the long-term relationship between rumination and anger. Thus far, initial distraction may be important when individuals experience anger because it provides such individuals a chance to calm themselves before reacting behaviorally.

Purpose and Goals of the Present Study

This study aimed to examine the relationships between rumination and distraction and depressed, anxious, and angry mood states. Rumination has been found to play a role in negative affect by either maintaining or increasing depressive, anxious, and angry moods, whereas distraction was found to decrease these negative moods. Nolen-Hoeksema's Response Styles Theory (1991) has been the main conceptual model used to study rumination. As stated previously, RST follows Bower's (1981) Associative Network Theory and thus, components of both theories have been used in this study to examine rumination. According to Bower, activation of an emotion node spreads through one's network, priming other emotions for activation. Therefore, it is logical that this activation could happen when studying multiple

negative mood states. This may have occurred when investigators attempted to extend the RST of depression to other negative affect, such as anxiety and anger (Blagden & Craske, 1996; Nolen-Hoeksema, 2000; Rusting & Nolen-Hoeksema, 1998). Recall that Blagden and Craske (1996) found that anxiety, sadness, and anger increased after an anxious mood induction. These researchers assumed they must have induced mood incorrectly, but based on other findings in the rumination literature, as well as Bower's ANT and Nolen-Hoeksema's definition of rumination, it is not surprising that inducing one negative mood state might affect other negative mood states. Thus, the complex relationship between various negative affect and rumination and distraction deserved further investigation. It still is not clear whether rumination affects multiple negative mood states concurrently or if rumination is more specific. This question remained after a review of the rumination literature.

The purpose of this study was to test the hypothesis that the effect of rumination occurs across mood states and is not specific to one type of negative mood. To examine this, participants were randomly assigned to a mood induction (i.e., depressed, anxious, or angry), and then randomly placed in a response task condition (i.e., rumination or distraction). Negative mood states (i.e., depression, anxiety, and anger) were assessed at baseline, post-mood induction, and post-response task. Participants were deceived about the assessment of mood in order to obtain more accurate reports of participants' mood states and to avoid possible demand effects. The following hypotheses were proposed:

1. Regardless of mood induction, depressed, anxious, and angry mood states would all increase following a rumination task, whereas those negative moods would decrease following the distraction task.

2. The effects of rumination would be the strongest for the mood induced (i.e., greater increase in depressed mood in rumination-depressed mood induction cell compared to any of the other conditions; greater increase in anxiety in the rumination-anxiety induction cell compared to any of the other conditions; greater increase in anger in the rumination-anger induction cell compared to any of the other conditions).

Method

Participants

A total of 90 women participated in this study. Women were recruited through the psychology subject pool and extra credit sign up sheets. Research assistants also made announcements in their classes, posted fliers around campus, and randomly handed out cards to women on campus asking if they were interested in participating in a dissertation study. Only women were investigated for a few reasons. The Response Styles Theory partly originated due to findings that women ruminate more than men. Also, gender differences have not been found in experimental studies when researchers have induced mood and initiated rumination (Mor & Winquist, 2002). More importantly, in this study, the specificity or generalization of rumination was under investigation and not gender differences.

Participants had the choice of receiving course extra credit, if available to them, or entering a raffle to win a fifty-dollar Target Gift Card. The majority of participants (N=76) chose to receive extra credit in a class. Only 14 participants chose to enter the raffle; of those, only two were not eligible to receive extra credit (one was a graduate student and one had recently graduated). A name was drawn after the data had been collected and the winner received the gift card.

The sample consisted of 22 freshmen (24.4%), 14 sophomores (15.6%), 19 juniors (21.1%), 33 seniors (36.7%), 1 recent graduate (1.1%), and 1 graduate student (1.1%). Ages of participants ranged from 18 to 47 years old ($M = 23.48$, $sd = 5.9$) with a median and mode of 22 years old (16.7%). The participant sample included 62 Caucasian (68.9%), 24 African-American (26.7%), and 4 Asian-American (4.4%) women. College majors and jobs of participants varied greatly. Of the 90 participants, 29 did not work (32.2%). Further, participants reported 21 different majors, although there were three main ones: 31 participants were psychology majors (34.4%), 13 were nursing majors (14.4%), and 8 were business majors (8.9%), whereas 3 were still undecided (3.3%).

Materials

Participants completed three packets of questionnaires over the course of the experiment: at the beginning of the study for baseline mood, after the mood induction task, and after the response task (i.e., rumination or distraction).

Mood questionnaire. Each packet included the Profile of Mood States, Brief Form (POMS-B; McNair, Lorr, & Droppleman, 1992). The POMS-B consists of 30 adjectives (e.g., “angry”, “sad”, “anxious”) and participants rank how they feel “right now” on a Likert scale of 0 to 4 (0 = not at all, 1 = a little, 2 = moderately, 3 = quite a bit, 4 = extremely). There are 5 items in each of the 6 POMS factors: Tension/Anxiety, Depression/Dejection, Anger/Hostility, Vigor/Activity, Fatigue/Inertia, and Confusion /Bewilderment. The POMS scale has been shown to have high internal consistency reliability and adequate construct validity (McNair et al., 1992).

To assess baseline mood, only the Tension/Anxiety, Depression/Dejection, Anger/Hostility, and Vigor/Activity factors were used, totaling 20 items. Those 4 factors were chosen because depression, anxiety, and anger were the focus of the study and positive items

were needed for balance. However, the only positive adjectives included in the POMS-B are the 5 items in the Vigor/Activity factor. Thus, 10 new positive adjectives were added as filler items to the baseline mood questionnaire in order to avoid a focus on negative mood, resulting in 15 positive and 15 negative items. All 6 factors of the POMS-B were included in the following post-mood induction and post-response task mood assessment, resulting in 25 negative and 5 positive items. Again, to minimize the focus on negative mood, 12 positive adjective filler items were added, totaling 42 items. This number allowed for 3 columns of 14 words, which provided balance and did not seem excessive in length. Positive words that were added as filler items were never duplicated and items on the mood assessments were presented in a different order each time in an attempt to make the participants believe they were responding to three different mood questionnaires. Since reliability and validity studies examine the factors separately, adding new items and changing the order likely did not impact the use of the scale (McNaire, Lorr, & Droppleman, 1992). For the purposes of this study, only the Tension/Anxiety, Depression/Dejection, Anger/Hostility factors were analyzed. The coefficient alphas for the 3 factors were, respectively, .83, .82, and .83 at baseline assessment, .85, .77, and .83 at post-mood induction, and .75, .84, and .73 for post-response task.

Filler Items. To further obscure the intent of the study, several brief filler tasks about dreams, imagination, and memory were included in each of the mood questionnaires. The filler items, as well as the response tasks, utilized in this study were replicated from Lyubomirsky and colleagues (1999) and were used with permission. Each mood and filler packet took no longer than three minutes to complete, and most participants completed each packet in less time.

Response task. Participants in both the rumination and distraction condition were given a separate set of 45 laminated cards to read and think about; each card had one statement. The

response tasks were designed to influence the content of participants' thoughts by having them focus their attention and think about a series of items (adapted from Lyubomirsky & Nolen-Hoeksema, 1995). Based on Nolen-Hoeksema's (1991; 1996) definition of rumination, the rumination condition cards required participants to focus their attention on statements that were emotion, symptom, and self-focused (e.g., think about what your feelings might mean, your current level of energy, why things turn out the way they do). Note that participants were not told to think about negative emotions or attributes. In the distraction condition, participants were asked to focus on statements that were external and not related to emotions, symptoms, or the self (e.g., think about a truckload of watermelons, the layout of your local post office). The items in both conditions were rated as equally neutral in affective tone by undergraduate judges in a previous study (Morrow & Nolen-Hoeksema, 1990). The response tasks have been effectively used in numerous rumination studies (Blagden & Craske, 1996; Lyubomirsky et al., 1998; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Lyubomirsky et al., 1999; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993).

Final Questions. After the final mood assessment, three questions were posed to gather additional information. One question asked for the month and year of the recalled memory, followed by whether or not they re-experienced the emotion. The final question was open ended and participants were asked to write about what they believed was the purpose of all the tasks they had completed.

Procedure

Participants were tested individually in rooms in the Psychology Department. Three research assistants were trained to run participants with the use of a script and a series of questionnaires/packets. The experimenter or a research assistant greeted the participant and

introduced the experiment as “an investigation of imagination, memory, dreams, and thought”. The purpose of the deception was to avoid possible demand characteristics; it was possible that knowing the intent of the study would have lead participants to either under or over estimate their mood experiences. The consent form was reviewed and participants were told that they would be engaging in a variety of small, but separate tasks. Participants were also told that their data would remain confidential and that they were free to withdraw from the experiment at any time.

After the consent form had been signed, participants completed the first packet of questionnaires, which included a demographic questionnaire, the mood inventory (POMS-B; McNair et al., 1992), and filler items about daydreaming. Participants were then randomly assigned to one of three mood inductions: depressed (N=30), anxious (N=30), or angry (N=30). The mood induction was introduced and described as a recall and imagination task. Participants were asked to recall and briefly write down three times in their life when they experienced the emotion assigned and then choose the event that was most upsetting to them (this procedure is replicated from Blagden and Craske, 1996). Instructions used by Rusting and Nolen-Hoeksema (1998) were then provided to participants who were asked to re-experience the event they chose and then write about it for eight full minutes. Meta-analyses have revealed that this type of mood induction is just as effective in inducing negative mood states as other types of negative mood inductions (Gerrards-Hesse, Spies, & Hesse, 1994; Westermann, Spies, Stahl, & Hesse, 1996). Afterward, participants were provided with the next packet consisting of the mood inventory and filler items about imagination.

Participants were then randomly placed in a response task condition, either rumination (N=15 per cell) or distraction (N=15 per cell). This was described as another imagination task

and participants were asked to read and focus their attention on 45 statements for eight minutes. Participants then completed the last packet of mood and filler items about memory. Finally, participants were debriefed and provided with an additional consent form stating they gave full consent to have their data used with the knowledge they had previously been deceived. All participants gave full consent after the debriefing and only three participants asked for a list of counseling options. The entire procedure took approximately 30 minutes. Due to the deception and the number of tasks, a script was provided to trained research assistants to ensure that participants received the same instructions.

After completion of the study, participants were permitted to enter into the raffle to win a 50-dollar Target gift card or receive class extra credit. Participants eligible for extra credit were either in the psychology subject pool or in classes in which professors agreed to give extra credit for participating. To enter the raffle, participants submitted their name and phone number; however, this information was kept separate from their data. Only fourteen women entered the raffle and one name was drawn after all data had been collected. The winner was notified in May 2005 and her prize was collected.

Results

Preliminary Analyses

Sample Size. Prior to the study, sample size was estimated with $\alpha = .05$ and a large effect of .80 (Cohen, 1992). The effect size of .76 was chosen from Mor and Winquist's (2002) meta-analyses of 23 rumination studies and is close enough to .80 to be considered a large effect. For 6 conditions, 14 participants were required per condition, for a sample size of 84. However, 15 participants were run per condition making the total sample size 90.

Random Assignment. Each person was randomly assigned to one of six conditions (N=15 per condition): depressed mood induction followed by the rumination task, depressed mood induction followed by the distraction task, anxious mood induction followed by the rumination task, anxious mood induction followed by the distraction task, angry mood induction followed by the rumination task, or angry mood induction followed by the distraction task. A one way (condition) multivariate analysis of variance (MANOVA) examining random assignment was not significant, Wilks' $F(3, 82) = .52, p = .93, \eta^2 = .03$, indicating that there were no significant differences between the six conditions and baseline measures of depressed, anxious, and angry moods. Thus, randomization appears to have been successful in equating the participants in baseline mood states. This and the following preliminary analyses were conducted in order to rule out the influence of pre-experimental differences on experimental outcomes.

Mood. The distributions for depressed, anxious, and angry mood scores were examined at baseline (time 1), post-mood induction (time 2), and post-response task (time 3). Non-normal distributions (positive skewness and kurtosis) were found for moods assessed at each time. Consequently, all of the mood assessment data were transformed to achieve a more normal curve. These transformed data were used to run all analyses involving mood.

Sample Characteristics and Baseline Mood States. A series of MANOVAs were run between select demographic characteristics and baseline depressed, anxious, and angry mood states to ensure there were no differences between specific sample characteristics and baseline mood states. No significant associations were found between ethnicity [Caucasian (N= 62) and non-Caucasian (N=28)] and baseline mood states (Wilks' $F(3, 86) = .80, p = .5, \eta^2 = .03$), age and baseline mood (Wilks' $F(63, 198) = 1.18, p = .2, \eta^2 = .27$), year in school and baseline mood (Wilks' $F(15, 227) = .94, p = .52, \eta^2 = .05$), college major (collapsed into broad

categories such as science) and baseline mood states (Wilks' $F(24, 230) = 1.38, p = .12, \eta^2 = .12$), or occupation (also collapsed into broad categories) and baseline mood (Wilks' $F(15, 227) = .67, p = .81, \eta^2 = .04$). Thus, it was concluded that sample characteristics did not significantly impact baseline mood states.

Age Event Occurred and Time since Event. To induce negative mood, each participant wrote about a personal experience/event. Participants' age at the time of the event ranged from 5 years 4 months old to 40 years 4 months old. Time since event ranged from 14 ½ years ago to the same week of participation in the study. The majority of participants ($N = 49$) retrieved memories from within the past year (54.4 %). Of those, 18 women chose to write about an event that occurred within the past month (20% of the entire sample). As part of the preliminary analyses, age at event and length of time since event were examined in relation to each of the negative mood states, focusing on the difference from baseline mood to post-mood induction. Thus, a T1- T2 change score was created to assess the difference in mood after participants wrote about and recalled their own personal negative events. Correlations run between age at the time of the event and post-induction change in negative mood (depression, $r = .12$; anxiety $r = .21$; anger, $r = .12$) and time since the event and change in negative mood (depression, $r = .11$; anxiety $r = .10$; anger, $r = .02$) were not significant, indicating that age at the time of the event and time since the event did not have a significant impact on participants' affective response to the mood induction procedures.

Mood Induction. To ensure that mood was actually induced, preliminary analyses also consisted of a mood manipulation check by running a repeated measures MANOVA to compare baseline mood scores to post induction mood scores. The overall effect for time was significant, Wilks' $F(6, 170) = 3.56, p < .01, \eta^2 = .11$, indicating that there was a difference in mood from

the baseline assessments of depressed, anxious, and angry mood to the post-mood induction assessments of those mood states. Univariate statistics for each mood condition were also significant [depressed mood ($F(2, 89) = 33.41, p < .001, \eta^2 = .28$), anxious mood ($F(2, 89) = 11.39, p = .001, \eta^2 = .17$), angry mood ($F(2, 89) = 18.03, p < .001, \eta^2 = .17$)]. Therefore, it was concluded that the mood induction was effective in increasing participants' negative mood states. The average mood scores assessed at baseline mood (time 1) and after the mood inductions (time 2) can be seen in Table 1. All mood inductions increased negative affect across negative mood states, regardless of mood induction. The mean scores presented in Table 2 show the increase of negative mood following the various mood inductions. Interestingly, anxiety was higher than anger and depressed mood following all three of the mood inductions.

Table 1

Means and Standard Deviations of Mood Scores at Time 1 and 2

Mood States	Time Mood Assessed			
	Baseline (1) (N=90)		Post Mood Induction (2) (N=90)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Depression	.92	.97	1.51	1.06
Anxiety	1.72	.98	2.08	.99
Anger	.87	.98	1.38	.1.25

Note: Higher numbers indicate higher levels of negative mood.

Table 2

Means and Standard Deviations of Moods Assessed at Times 1 and 2 by Mood Induction

Moods Measured	Mood Inductions											
	Depressed (N=30)				Anxious (N=30)				Angry (N=30)			
	Time 1		Time 2		Time 1		Time 2		Time 1		Time 2	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Depression	.75	1.05	1.67	1.09	.95	.87	1.29	1.05	1.06	.98	1.57	1.05
Anxiety	1.81	1.03	2.17	1.02	1.57	1.11	2.10	.99	1.78	.80	1.97	.99
Anger	.78	.96	1.11	1.07	.80	.11	1.18	1.31	1.03	.85	1.87	1.25

Note: Higher numbers indicate higher levels of negative mood.

Primary Analyses

Hypothesis 1: Post Response Task Mood States. The first hypothesis predicted that regardless of type of mood induction (i.e., depressed, anxious, angry), depressed, anxious, and angry mood states would all increase following the rumination task and decrease following the distraction task. Using a repeated measures (times 1, 2, 3) MANOVA (time X response task condition), the overall effect for time was significant, Wilks' $F(6, 83) = 3.57, p < .01, \eta^2 = .21$, indicating that there was a difference in negative mood states across time. Univariate statistics for each mood assessed were also significant [depressed mood ($F(2, 88) = 4.90, p < .01, \eta^2 = .05$), anxious mood ($F(2, 88) = 6.81, p = .001, \eta^2 = .07$), angry mood ($F(2, 88) = 4.16, p < .05,$

$\eta^2 = .05$]. Pairwise comparisons for time were made for each of the negative mood states, showing a significant increase in mood from times 1 to 2 and a significant decrease in mood from times 2 to 3. Although there was a significant interaction between negative moods and response task, negative moods decreased following the rumination task, contrary to the hypothesis. However, as expected, negative moods also decreased following the distraction task. Mood decreased significantly more following the distraction task than the rumination task. Change of moods over time by response task can be seen in Table 3.

Table 3

Response Task by Mean and Standard Deviation Mood Scores across Time

Moods Measured	Rumination (N=45)						Distraction (N=45)					
	Time 1		Time 2		Time 3		Time 1		Time 2		Time 3	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Depression	.80 _a	.93	1.53 _b	1.11	1.21 _c	1.11	1.04 _a	1.0	1.49 _b	1.02	.85 _c	.96
Anxiety	1.63 _a	1.1	2.12 _b	1.02	1.66 _c	.98	1.81 _a	.87	2.04 _b	.97	1.06 _c	1.05
Anger	.76 _a	.85	1.46 _b	1.15	.95 _c	.83	.98 _a	1.09	1.31 _b	1.35	.54 _c	.90

Note: Means in the same row that do not share the same subscript differ at, $p = .05$ Tukey honestly significant difference comparison. Higher numbers indicate higher levels of negative mood.

As predicted, regardless of mood induction, depressed, anxious, and angry mood states all significantly decreased following the distraction task. Moreover, participants reported less negative mood after distracting than the initial baseline mood assessment. However, contrary to expectations, ruminating did not increase negative mood states, but instead, decreased negative

mood. Thus, only half of the first hypothesis was supported. This will be discussed in further detail later.

Hypothesis 2: Rumination Task and Negative Mood. The second hypothesis predicted that the rumination task would have the greatest impact on the mood that was induced. That is, the particular mood state that was induced was expected to be greater post-rumination than mood scores for the other two mood states measured. A repeated measures (times 1, 2, 3) three-way MANOVA (time X induction X response task) showed that the overall interaction effect was not significant, Wilks' $F(12, 158) = .96, p = .49, \eta^2 = .07$. Although overall results were not significant, this interaction effect accounts for 7% of the variance. Closer examination of the data showed that the prediction was supported for the anxious mood induction. That is, following the anxious mood induction and rumination task, anxious mood ($M = 1.59, sd = .89$) was reported at a much higher level than either depressed ($M = .97, sd = .93$) or angry ($M = .99, sd = .82$) mood states. Depressed and angry inductions did not produce the same effect. Depressed mood following induction and rumination scored between anxiety and anger, whereas angry mood following induction and rumination was reported below both anxiety and depressed mood states. Conversely, when examining mood inductions followed by distraction, angry mood was lower than depressed and anxious moods following the angry mood induction and distraction task. For all three negative mood states, the distraction task lowered negative affect below baseline.

Thus, the second hypothesis was not significantly supported. Ruminating did not increase depressed and angry moods relative to the other moods assessed after the mood-specific inductions. Interestingly, the rumination task did have the greatest specific impact on anxious mood. For a complete review of how each condition affected the differing mood states across

time, refer to Table 4 for depressed mood states, Table 5 for anxious mood states, and Table 6 for anger mood states.

Table 4

Depression Scale Mean and Standard Deviation Mood Scores by Time, Response Task, and Mood Induced

Response Task	Mood Induction					
	Depressed (N=30)		Anxious (N=30)		Angry (N=30)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Rumination						
Time 1	.67	1.08	.84	.77	.90	.96
Time 2	2.04	1.02	1.11	1.12	1.44	1.07
Time 3	1.30	1.38	.97	.93	1.37	1.0
Distraction						
Time 1	.83	1.06	1.06	.97	1.23	1.01
Time 2	1.29	1.07	1.47	.98	1.71	1.05
Time 3	.76	.98	.99	.94	.81	1.01

Note: Higher numbers indicate higher levels of negative mood. Time 1 refers to baseline mood, Time 2 is post-mood induction, and Time 3 is post-response task.

Table 5

Anxiety Scale Mean and Standard Deviation Mood Scores by Time, Response Task, and Mood Induced

Response Task	Mood Induction					
	Depressed (N=30)		Anxious (N=30)		Angry (N=30)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Rumination						
Time 1	1.79	1.19	1.39	1.16	1.71	.94
Time 2	2.41	1.07	2.02	.95	1.92	1.03
Time 3	1.79	1.11	1.59	.89	1.60	.99
Distraction						
Time 1	1.82	.89	1.74	1.06	1.86	.66
Time 2	1.93	.94	2.17	1.05	2.03	.97
Time 3	1.17	1.02	.93	1.34	1.09	.77

Note: Higher numbers indicate higher levels of negative mood. Time 1 refers to baseline mood, Time 2 is post-mood induction, and Time 3 is post-response task.

Table 6

Anger Scale Mean and Standard Deviation Mood Scores by Time, Response Task, and Mood Induced

Response Task	Mood Induction					
	Depressed (N=30)		Anxious (N=30)		Angry (N=30)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Rumination						
Time 1	.79	.92	.64	1.03	.86	.60
Time 2	1.37	1.03	1.07	1.25	1.94	1.06
Time 3	.96	.89	.99	.82	.90	.84
Distraction						
Time 1	.77	1.04	.96	1.20	1.21	1.04
Time 2	.84	1.08	1.29	1.39	1.79	1.46
Time 3	.43	.67	.63	1.11	.57	.93

Note: Higher numbers indicate higher levels of negative mood. Time 1 refers to baseline mood, Time 2 is post-mood induction, and Time 3 is post-response task.

Mood Induction by Time. When further examining the repeated measures (times 1, 2, 3) three way MANOVA, the overall finding for time by induction type was significant, Wilks' $F(12, 158) = 2.76, p < .01, \eta^2 = .17$. However, univariate tests of each mood showed only anger to have a significant interaction with time and mood induction, $F(4, 168) = 2.72, p < .05, \eta^2 = .06$. No significant interactions were found when depressed mood and anxious mood were examined separately with mood induction and time. Thus, anger appears to have a different effect compared to anxious and depressed mood states. Compared to the other two moods, participants in the angry mood induction reported a significant increase in their anger, as well as a significant decrease following the response tasks.

Response Task by Time. The overall repeated measures (times 1, 2, 3) three way MANOVA was also significant for response task conditions and time, Wilks' $F(6, 79) = 3.47, p < .01, \eta^2 = .21$. Univariate statistics for each mood examined individually were also significant [depressed mood ($F(2, 168) = 5.13, p < .05, \eta^2 = .06$), anxious mood ($F(2, 168) = 6.65, p < .05, \eta^2 = .07$), angry mood ($F(2, 168) = 4.27, p < .05, \eta^2 = .05$)]. These results indicate that the rumination and distraction task differently impacted all negative mood states.

Secondary Analyses

On the last questionnaire, participants were asked if they re-experienced the mood assigned during the mood induction by choosing a yes or no response. The majority of the participants ($N = 69, 76.7\%$) claimed that they did re-experience the mood. A two-way MANOVA (re-experience event or not X time 2) was conducted to examine whether there was a difference in post induction mood scores in women who stated they re-experienced the mood versus those who did not. Results were not significant, Wilks' $F(3, 86) = .70, p = .53, \eta^2 = .02$, indicating that there were no differences in post induction mood scores among women in the

total sample, regardless of whether they reported re-experiencing the induced mood state or not. Combined with the previous finding that the mood inductions were effective in increasing negative mood, it can be concluded that there was at least an immediate effect of the induction, even for women who did not report feeling the emotion in the same way as the original experience.

Another final item asked participants to describe their beliefs about the purpose of the study. This question was posed to help determine if the initial deception used at the beginning of the study was effective. Based on participants' open-ended responses, as coded by the researcher, participants were placed into the 4 following categories; of the total sample, 58 (64.4%) participants either did not understand or did not guess the main purpose of the study, 19 (21.1%) somewhat understood, 9 (10%) mostly understood, and only 4 (4.4%) actually understood or accurately guessed the purpose of the study. A repeated measures MANOVA found no significant differences (Wilks' $F(27,228) = 1.11, p = .33, \eta^2 = .11$) among the 4 categories of understanding and participants' mood states throughout the study. Thus, it appeared that women responded naturally to the tasks and likely did not change their responses to fit any assumptions they had about the purpose of the study.

Discussion

The findings from this study further support Bower's Associative Network Theory (ANT; 1981) and only partially support Nolen-Hoeksema's Response Styles Theory (RST; 1991, 1996). Regardless of which moods were induced, depressed, anxious, and angry mood states all increased. Hence, priming one negative mood state activated other negative moods, which supports the premise of ANT that negative moods do interact. In concurrence with RST, the distraction task significantly reduced depressed, anxious, and angry mood states. Moreover,

these negative moods were significantly lower after the distraction task than at baseline. Yet, contrary to prediction, the rumination task did not increase negative mood states in this study, and thus, RST was not supported in a nonclinical sample for rumination.

These effects of rumination and distraction were similar to findings in the study on which this dissertation was based. Recall that Blagden and Craske (1996) found that the anxious mood induction increased anxious, sad, and angry moods and that the distraction task then alleviated those moods. Rumination, however, only maintained those negative mood states. In both the Blagden and Craske (1996) study and this dissertation, nonclinical populations were used, which could perhaps be the reason that the rumination task did not significantly impact the participants' mood. It is likely that the rumination task designed by Nolen-Hoeksema does not have a significant effect in individuals who are not expressing very much or any emotional distress.

Similarly, in a prior study, nondepressed college students who first distracted and then ruminated reported an initial decrease in depressed mood that did not increase after ruminating (Trask & Sigmon, 1999). This finding further suggests that for people who do not report clinical symptoms and who are in a neutral or positive mood state, a rumination task is less likely to occur or have a profound effect on thinking or mood. As stated, this could explain the results in this dissertation study. That is, participants could have started out with more positive feelings and used the rumination task solely as a distraction from their recently induced negative mood state. It is probable that the rumination task did not prove effective because participants were not in the negative frame of mind necessary to initiate a ruminative cycle. It is also likely the rumination task did not have a significant effect given that both the rumination and distraction response tasks were previously rated as equally neutral in affective tone by undergraduate judges in a previous study (Morrow & Nolen-Hoeksema, 1990). Participants overall did not initially

endorse many negative symptoms and thus, likely did not interpret the rumination task as something negative. Indeed, some women stated they were in such good moods that they interpreted each rumination item positively. Thus, for some individuals, the rumination task was a positive experience.

Moreover, during debriefing, none of the participants in this study stated that they had ongoing or current problems with negative mood or admitted to being clinically treated. In a recent study, positive affect mediated the link between distraction and psychological adjustment in students who reported they had never been depressed, whereas negative affect mediated the link between rumination and depressive symptoms in students who reported they had been previously depressed (Chang, 2004). It is unknown whether participants in this dissertation study had been previously depressed, but because they currently were not endorsing such symptoms, it may have been easier for them to dismiss their newly induced negative mood state. There is likely a resiliency in people who have primarily positive mental health when responding to negative events and moods.

In most of the studies previously discussed, the rumination task either maintained or increased depressed mood in individuals who reported symptoms of dysphoria, whereas the distraction task decreased depressed mood similar to levels seen in nondysphoric participants (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Nolen-Hoeksema & Morrow, 1993; Vickers & Vogeltanz-Holm, 2003). In these studies, the rumination and distraction tasks typically had no effect on nondepressed participants who were used as a control group and did not undergo a mood induction. However, one set of researchers found that nondepressed college students reported significantly more depressed mood following a mood induction and rumination task (Trask & Sigmon, 1999). Perhaps the rumination task exhibited an effect on that nondepressed

population because only one negative mood state, depressed mood, was assessed. Conversely, examining multiple negative affect concurrently may be somewhat more difficult for participants because it forces them to think about and answer more questions about their mood. It is possible that results in this dissertation study would have been different if only one negative mood state had been assessed because there would have been fewer questions, and thus, only one type of mood to concentrate and describe. Still, it seems that overall, participants were able to attend to and describe their mood states throughout the study.

Interestingly, when examining the negative mood states separately, only anger showed a significant interaction with time and mood induction. This is similar to previous studies where college students who ruminated after an angry mood induction exhibited an increase in angry feelings (Bushman, 2002; Rusting & Nolen-Hoeksema, 1998). In these studies, the more college students ruminated about their angry feelings, the more aggressive they became when given the chance to behaviorally react. Although participants in this dissertation study did not have that opportunity, the angry mood induction did increase anger to significantly higher levels than either depressed or anxious moods. Following the distraction task, anger was reported much lower than depressed or anxious mood states, regardless of mood induction, and at levels lower than baseline mood. A previous study found when women were given the choice between ruminating and distracting after an anger induction that women preferred to distract themselves from their angry feelings (Rusting & Nolen-Hoeksema, 1998). In this dissertation study, women were able to tap into their anger, but seemed to find it easier to relinquish that feeling after both the rumination and distraction conditions compared to the other two negative emotions.

Although ruminating did not produce significant effects across all mood states, the rumination task did have the greatest impact on the anxious mood induction. Following this

induction and rumination, anxious mood was much higher than either depressed or angry mood states. The prediction did not hold true for the latter two moods. After the depressed mood induction and the rumination task, anxious mood was highest, followed by depressed, then angry moods. Similarly, following the angry mood induction and rumination, anxious mood was again reported highest, followed by depressed, then angry moods. Overall, after the rumination task, anxiety was reported much higher than either depressed or angry moods. This is contrary to findings in a previous study where depressed and angry moods were independently related to rumination, whereas anxious mood was not significantly related to rumination after controlling for angry and depressed moods (Thomsen et al., 2003). In this dissertation study, it is not clear why anxiety was reported at higher levels than depressed or angry moods. Conceivably, participating in an experimental study may be anxiety provoking for students. It is also likely that the task of spending some time writing about a past, personal, and upsetting moment could have caused more anxious feelings in participants.

Moreover, perhaps a lack of clarity in terminology caused confusion. That is, some women in this study expressed that they were not sure what the term anxiety meant and required explanation. A few women stated that they thought anxiety meant “anything excitable”. Two participants did not ask about the meaning and instead continued to write about happy events in their life, although admittedly anxiety provoking ones, during the mood induction (i.e., birth of first child and getting married). These women described a variety of feelings, but labeled their overall mood at the time as happy and wrote in a positive manner. This study was researching negative mood, and so the data had to be discarded. Surprisingly, most of the women who questioned the meaning of the term anxious were psychology majors.

A weakness of this study was the assumption that participants would understand what the terms depressed, anxious, and angry meant. It is strongly suggested that future studies examining anxiety include an operational definition for participants to refer. Consequently, more studies examining negative mood states concurrently need to be done to decipher how people recognize and report their various negative mood states. Future research should also examine rumination and distraction with negative mood states, simultaneously and separately, in order to clarify such differences in reported and behavioral reactions to negative emotions.

Additionally, there may be a need to re-evaluate the rumination items on the response task and remove those that are not closely tied conceptually to RST or do not fit within Nolen-Hoeksema's definition of rumination. As expected, participants' negative mood after the distraction task was significantly lower than participants' mood after the rumination task, suggesting that these two conditions caused slightly different responses. Yet, it seems that all participants responded to both response conditions as some form of distraction from their negative mood since negative mood decreased in both cases. Even the participants who recalled a very upsetting time during their mood induction, with some events occurring as recent as within the past month or week, tended to state during debriefing that they had either over come, or were working out, the upsetting event. Many women also stated that some of the statements (e.g. think about your character and who you strive to be, the things that are most important in your life, etc.) actually made them think about how far they had come and what they had achieved in their lives. Perhaps removing such items (e.g., the kind of student you are and wish you were, what people notice about your personality, the things that are most important in your life, how you feel about your friendships, whether you have accomplished a lot so far, the long-term goals you have set, your physical appearance, how similar/different you are relative to other

people, your character and who you strive to be) may be helpful for future rumination researchers.

Another reason participants may not have been greatly impacted by the rumination task is because they may not have taken it seriously or actively engaged in the task. Participants were left alone in a room for eight minutes and were told to concentrate and think about each task statement. It is likely that participants just flipped through the items they were given and did not pay the attention required for the task to be effective. An additional weakness of this study was that there was no check designed to verify that participants did as they were instructed. An idea for future researchers using a similar, nonclinical population might be to tell the participants that they will later be questioned about what some of the statements meant to them to ensure that items are at least read thoroughly. As deception was already being used in the study, this included instruction would have been a small addition.

As previously stated, deception was necessary in this study to avoid possible demand effects. If participants knew this study focused on negative affect, they may have either under or over estimated their mood states. It was imperative that participants responded naturally to the tasks. Participants were told that the tasks involved focused on memory, imagination, and thinking, and that they had various packets to complete, which was true. The participants, however, were not told that the packets included mood questionnaires. The American Psychological Association's Code of Ethics (2003) state that deception can be used if it is justified, if it does not cause pain or distress, and if participants are fully debriefed and permitted to withdraw their data. This study met those qualifications.

Another ethical issue in this study concerned diversity. Although sample characteristics did not significantly impact baseline mood states, individual or cultural differences could have

affected responses. This study consisted of mostly Caucasian women, some African-American women, and only a few Asian-American women, with ages spanning 18 to 47. Although all women were American, it is possible that there were culturally specific differences among participants in responding to affective measures and the response tasks. It is unknown if this happened in this study because the issue was not directly addressed. A suggestion for future researchers would be to examine differences between individuals that differ in culture, ethnicity, and age. Many researchers use college students as participants and there is likely the tendency to diminish cultural differences among that sample. Another idea for future research is an in-depth study focusing on cultural differences in responding to affective measures and ruminating.

The strength of this dissertation study was examining negative mood states concurrently. Past researchers have assumed that a negative mood induction is specific to that mood, whereas this study found that all negative mood states increased regardless of specific negative mood induction. That is, a depressed mood induction does not just increase depressed mood, but also anxious and angry moods. Moreover, past researchers have typically only focused on one mood when researching RST. Few people only experience one emotion at a time and this study helped show that various moods can be manipulated and assessed simultaneously. Future studies should also examine negative mood states concurrently with various clinical populations in order to understand the ramifications that rumination and distraction has across clinical negative mood states and disorders.

Another suggestion for future researchers would be to replicate this study in a nonclinical, adult male population. It would be interesting to examine how the tasks in this study affect men. Considering past findings, it is likely the anger induction and rumination task would produce a stronger effect in men than either the anxious or depressed inductions. That is, men

have reported that they are more likely to express or respond behaviorally to their anger, whereas they often ignore or dismiss anxious or sad feelings. Contrarily, women in this study reported that they experienced anxiety throughout the study, but were able to minimize their angry feelings.

Thus, the major contribution of this study was being the first to examine concurrent negative mood states in a nonclinical, all female sample. Although rumination did not increase negative mood, distraction did significantly decrease moods, which offers partial support for Nolen-Hoeksema's RST (1991, 1996). It is logical that the spreading of emotions causes more negative mood states and disorders, which spurs on ruminating thoughts and feelings, keeping people in a ruminative negative cycle. Thus, it will be helpful to future researchers to examine RST and Bower's ANT (1981) together. Having a better understanding of how various moods affect other negative moods, regardless of gender, may help ruminators alleviate their symptoms. In conclusion, the findings from this dissertation study show that regardless of initial negative mood state, one mood can activate another, and therefore, negative moods can either be alleviated or strengthened depending upon what thoughts or emotions a person focuses.

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