



What predicts the trajectory of rumination?: A prospective evaluation

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ABSTRACT

The current report aimed to document individual differences that predict the trajectory of post-event rumination following an evaluative event. In this study, 127 undergraduate students were assessed over a 5-day period preceding and following a mid-term exam. Participants completed measures of anticipatory processing, trait test anxiety, trait tendency to ruminate, negative affect, and post-event rumination. Hierarchical linear modeling was used to examine predictors of post-evaluative rumination. Results suggested that individuals who reported high levels of anticipatory processing and trait test anxiety tended to experience prolonged amounts of rumination following the exam, even when controlling for negative affect, relative to those who scored low on these measures. These results suggest that specific individual difference factors impact the amount and trajectory of rumination beyond levels of general negative affect. Implications for understanding risk factors for heightened rumination are discussed, with particular attention to the larger rumination literature.

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Recently, there has been an increase in research examining repetitive, self-focused thoughts (e.g., Mor & Winquist, 2002). This literature has documented that negative self-focused thoughts may lead to increases in negative affect, which in turn leads to increases in repetitive thoughts (e.g., Mor & Winquist, 2002). One of the most well researched self-focused thought processes is rumination, which is defined as a recurrent and excessive focus on perceived negative aspects of a past event. Rumination has been postulated to be a mechanism in the maintenance of both depressive and anxiety disorders (e.g., Clark & Wells, 1995; Nolen-Hoeksema, 1991). However, at present little is known about which individual difference factors may lead to post-event rumination following stressful events. The goal of the current report is to address this gap by examining how rumination unfolds over time following an evaluative event.

Several theoretical perspectives have been developed on rumination (e.g., Martin, Shrira, & Startup, 1999; Matthews & Wells, 1999; Watkins, 2004). Generally, these theories suggest that during stressful situations, individuals engage in certain cognitive or behavioral strategies to regulate their mood (e.g., Carver & Scheier, 1988; Martin & Tesser, 1989, 1996). Although problem-focused strategies, such as cognitive reappraisal, lead to increases in positive emotion (Gross & John, 2003), emotion-focused strategies like rumination lead to increased negative affect (e.g., Martin &

Tesser, 1989, 1996). Considerable research has documented the negative effects of ruminative thought among dysphoric individuals, suggesting that depressive rumination increases negative mood, hinders problem-solving, and impairs concentration (e.g., Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Morrow & Nolen-Hoeksema, 1990). With a few notable exceptions (e.g., Fresco, Frankel, Mennin, Turk, & Heimberg, 2002; Muris, Roelofs, Meesters, & Boomsma, 2004; Nolen-Hoeksema, 2000), the role of rumination among anxious individuals has received little attention. Given that rumination has been shown to contribute to depressive mood states, it is timely to explore its role in anxiety-related processes. In particular, elucidating how rumination unfolds following evaluative events can inform our theories of the development of anxious symptomatology.

To date, our current framework for understanding the role of rumination in anxiety comes from theories of social anxiety disorder (Clark & Wells, 1995). Clark and Wells (1995) posited that among individuals with high levels of social anxiety, post-event rumination occurs after ambiguous social or performance situations and is characterized by a review of the negative thoughts and feelings that the individual experienced during the situation. This excessive focus on perceived negative reactions strengthens the individual's beliefs about their negative performance. Several studies testing this theory have found correlations between anxiety-provoking situations and post-event rumination among unselected samples (Fehm, Schneider, & Hoyer, 2007; Kocovski & Rector, 2007; Rachman, Gruter-Andrew, & Shafran, 2000; Vassilopoulos, 2004). Studies using laboratory tasks (i.e., an impromptu speech or a social interaction with a confederate) have found that individuals who report higher levels of social fears also

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report higher amounts of negative post-event rumination following these tasks (i.e., Abbott & Rapee, 2004; Dannahy & Stopa, 2007; Edwards, Rapee, & Franklin, 2003; Perini, Abbott, & Rapee, 2007). In a naturalistic study, Lundh and Sperling (2002) examined rumination following social-evaluative events using a diary method over a 2-day period. Results found that although post-event rumination decreased among all individuals, those with elevated levels of social anxiety were more likely to report elevated levels of post-event rumination following social-evaluation.

Thus, growing evidence supports the association between social-evaluative events and post-event rumination. However, a study by McEvoy and Kingsep (2006) suggests that post-event rumination may not be associated with social anxiety per se, but instead may be associated with state anxiety levels (McEvoy & Kingsep, 2006). This finding highlights an important feature of the larger literature on rumination; at present, the extent that rumination is uniquely associated with anxiety and/or depression is unclear. In particular, it is possible that rumination is associated with general negative affect following stressful or evaluative events (Thomsen, 2006). Because rumination is associated with several forms of psychopathology (e.g., Nolen-Hoeksema, 2000), research is needed to document specific individual difference factors that lead to the development of rumination, over and above its association with negative affect. Moreover, many previous studies compare participants' levels of rumination following a variety of stressful events rather than one specific event which is experienced by all participants (e.g., Fehm et al., 2007; Kocovski & Rector, 2007; McEvoy & Kingsep, 2006; Rachman et al., 2000). This methodological approach could lead to a response bias based on how recent or how negatively perceived the events in question were rated. Use of prospective designs to examine how rumination occurs following a specific stressor could advance our knowledge in this area. Thus, the current study utilized a prospective design, testing participants over a 5-day period preceding and following a mid-term exam, in order to examine individual-level predictors of the trajectory of rumination.

To select factors that would serve to predict post-event rumination, we drew on theoretical perspectives from both the anxiety and depression literatures. Because previous research has rarely included prospective designs, we wanted to carefully select predictors, while remaining mindful of constraints from sample size. Research by Nolen-Hoeksema and colleagues has found that certain individuals, referred to as trait ruminators, consistently respond to stressful events with rumination (e.g., Nolen-Hoeksema & Davis, 1999; Nolen-Hoeksema, Morrow, & Fredrickson, 1993). A trait ruminative style refers to a tendency to think repetitively and passively about negative emotions, distress, and the meaning of these affective states (Nolen-Hoeksema, 2000). Trait rumination has been shown to predict the onset of depression and anxiety, as well as the chronicity of depressive symptoms in community-dwelling adults (Nolen-Hoeksema, 2000). In an effort to link the current study with the available literature on rumination in general, trait rumination was included as a possible predictor. Second, three studies to date have shown that individuals with high levels of trait anxiety are more likely to ruminate following stressful events (Nolen-Hoeksema, 2000; Rachman et al., 2000; Zeidner, 1998). These studies have focused on diverse samples, including community adults ranging in age between 25 and 75 (Nolen-Hoeksema, 2000), high school students (Zeidner, 1998) and undergraduates (Rachman et al., 2000; Zeidner, 1998), within a variety of contexts. Because trait anxiety appears to be a robust predictor of post-event rumination, it also was selected as a possible predictor. Finally, cognitive models of anxiety suggest that anticipatory processing, during which individuals review what they believe will happen during an upcoming social-evaluative event, also should lead to higher levels of rumination subsequent to the event (Clark & Wells,

1995). Although no studies have examined whether anticipatory processing is related to post-event rumination, from a theoretical perspective anticipatory processing emerges as an important potential predictor. Exploration of whether trait rumination, trait anxiety, and anticipatory processing predict different trajectories of rumination will increase our understanding of the individual differences that prolong rumination and as a result, anxious symptomatology.

The current study examined the trajectory of rumination following a mid-term exam, as it is a common anxiety-provoking situation that research has suggested elicits similar coping strategies as those employed for major life stressors (Zeidner, 1996). This design allowed for a prospective examination using the same anxiety-related event for all participants in a natural setting. The first assessment occurred the night before the exam when participants completed measures of trait test anxiety, trait tendency to ruminate, and the amount of anticipatory processing about the test. During the next four nights, participants reported the amount of time they spent ruminating about their exam performance. Because rumination has been shown to be associated with several forms of negative affect, participants also completed a measure of negative affect at each measurement. Two hypotheses were examined. First, it was hypothesized that rumination would decrease linearly over time. Second, it was hypothesized that individuals who reported higher levels of trait test anxiety, trait tendency to ruminate, and anticipatory processing would exhibit slower decreases in rumination over the course of the 4 days post-exam compared to those with low levels on these variables even when controlling for negative affect.

1. Method

1.1. Participants

Participants were recruited from advanced undergraduate psychology courses offered at the University at Buffalo. Announcements were made within these courses inviting students to participate in a study about college mid-term exams and stress as a means of obtaining extra credit. All course instructors offered alternative opportunities for students to receive extra credit. Interested participants contacted the laboratory and were provided with information about participation. Although students were allowed to choose which mid-term they would use to complete the study, they only could complete the study once. Additionally, participants were not allowed to complete the study using their final exam in the course.

One-hundred and thirty-four participants contacted the research team and completed at least one experimental session. Four participants were excluded because they did not complete the first experimental session, and 3 participants were excluded because they only attended the first session, leaving a total of 127 participants (97 females). The average age of the participants was 22.6 (SD=4.3). Ninety (70.9%) were Caucasian, 13 (10.2%) were African-American, 15 (11.8%) were Asian, 5 (3.9%) were Latino(a), and 4 (3.1%) identified as other ethnicities. The average college GPA was 3.2 (SD=0.5).

Participants completed questionnaires at five time points. At Time 1, questionnaires measured trait test anxiety, trait tendency to ruminate, and the amount of anticipatory processing. For all subsequent time points (i.e., Time 2 through Time 5), participants completed measures of post-event rumination and negative affect. Questionnaires were administered on-line using Survey Monkey. All participants received email reminders to complete their surveys each night. Throughout the course of the study, participants were unaware of the grade that they actually earned on the exam,

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