The unique effects of angry and depressive ruminations on eating-disorder psychopathology and the mediating role of impulsivity

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\textbf{A R T I C L E I N F O}

\textbf{Keywords:}
Angry rumination
Depressive rumination
Eating disorders
Impulsivity

\textbf{A B S T R A C T}

Negative affect and maladaptive emotion regulation strategies are associated with eating-disorder (ED) psychopathology. Depressive rumination is a maladaptive cognitive style associated with the onset, maintenance, and severity of ED psychopathology among both clinical and nonclinical samples. However, although anger is also strongly associated with ED behaviors, the associations between angry rumination and ED psychopathology, as well as mechanisms of the relationships between rumination and ED psychopathology, remain largely unknown. The current study sought to examine the unique influences of trait depressive and angry rumination on ED psychopathology and whether trait negative urgency (i.e., responding rashly to negative affect) mediated these relationships. Study 1 sampled undergraduate students (\(N = 119\)) cross-sectionally and longitudinally (five months), and Study 2 sampled patients with eating disorders (\(N = 85\)). All participants completed questionnaires assessing angry rumination, depressive rumination, ED psychopathology, and negative urgency. Angry rumination had consistent indirect effects on ED psychopathology via negative urgency among both clinical and nonclinical samples. However, there was mixed support for the influence of depressive rumination: whereas depressive rumination showed total and indirect effects on ED psychopathology in Study 1 cross-sectional analyses, no total or indirect effects emerged in Study 1 longitudinal analyses or in Study 2. Associations between depressive rumination and ED psychopathology may reflect the strong overlap between angry and depressive rumination. Interventions targeting angry rumination and negative urgency may enhance prevention and treatment of disordered eating across eating disorder diagnosis and severity.

1. Introduction

Negative affect is a fundamental component of etiological and maintenance models of eating disorders. Affect regulation models of eating disorders hypothesize that disordered eating behaviors serve an emotion regulation function for individuals experiencing negative affect who do not have more adaptive coping skills (Haynos & Fruzzetti, 2011; Polivy & Herman, 1993). Supporting these theories, heightened anger and sadness often precedes disordered eating (Lavender et al., 2016), and associations between emotion dysregulation and eating-disorder (ED) psychopathology in clinical (Lavender et al., 2015) and nonclinical (Haynos, Wang, & Fruzzetti, 2018) populations are well-established. However, coping with negative emotion is a broad construct that may confound the roles of more specific forms of coping. A better understanding of specific maladaptive strategies used for handling negative affect in ED psychopathology has the potential to inform treatments. Ruminations, or a cognitive style involving the tendency to perseverate on negative feelings and problems, has received recent attention as a maladaptive response to negative moods (Watkins, 2008). Researchers define different types of rumination based on the predominant negative content of the repetitive thoughts (Ciesla, Dickson, Anderson, & Neal, 2011), with depressive and angry rumination being distinct constructs that are differentially associated with various psychopathologies (du Pont, Rhee, Corley, Hewitt, & Friedman, 2017; Peled & Moretti, 2007, 2010). The current study explores the unique roles of both depressive and angry rumination, and a potential mediating mechanism, in predicting ED psychopathology in nonclinical and clinical samples.

Depressive rumination is consistently implicated in the development and maintenance of ED psychopathology. Depressive rumination prospectively predicts the onset of binge-eating and purging behaviors among undergraduates (Gordon, Holm-Denoma, Troop-Gordon, & Sand, 2012) and adolescents (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Individuals with anorexia nervosa (AN) and bulimia nervosa (BN) also report significantly more depressive rumination than healthy individuals (Cowdrey & Park, 2012). Moreover, depressive rumination

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https://doi.org/10.1016/j.eatbeh.2018.02.004
Received 20 June 2017; Received in revised form 2 February 2018; Accepted 13 February 2018
Available online 17 February 2018
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is associated with severity of ED psychopathology among nonclinical samples (Wang & Borders, 2017), individuals with AN (Rawal, Park, & Williams, 2010; Startup et al., 2013), BN (Naumann, Tuschen-Caiffier, Voderholzer, Caiffier, & Svaldi, 2015), and binge-eating disorder (BED) and obesity (Wang, Lydecker, & Grilo, 2017).

By contrast, almost no literature has examined associations between angry rumination and ED psychopathology. Defined as a repetitive focus on anger and its causes and consequences (Sukhodolsky, Golub, & Cromwell, 2001), angry rumination exacerbates existing angry affect and is associated with emotion dysregulation, impulsivity, and risky behaviors (Selby, Anestis, & Joiner, 2008). Despite well-established associations between difficulties coping with anger and ED psychopathology (Waller et al., 2003), only two studies have examined angry rumination and ED psychopathology, showing positive correlations between angry rumination and symptoms of bulimia in undergraduates (Selby et al., 2008) and individuals with borderline personality disorder (Selby, Anestis, Bender, & Joiner, 2009). However, whether angry rumination is more broadly associated with ED psychopathology, and whether angry and depressive rumination uniquely influence ED psychopathology, remains unknown. Although angry and depressive rumination both involve negative repetitive thought processes, depressive rumination appears to be more strongly associated with internalizing psychopathology, whereas angry rumination is more strongly associated with externalizing psychopathology (Ciesla et al., 2011; du Pont et al., 2017; Peled & Moretti, 2010). Although some studies have found EDs to load onto a latent internalizing factor (Mitchell, Wolf, Reardon, & Miller, 2014), EDs are also strongly associated with externalizing disorders such as substance use disorders (Hudson, Hiripi, Pope, & Kessler, 2007). Thus, examining the unique influence of depressive and angry rumination on ED psychopathology extends this previous research and may enhance our understanding of how various types of rumination are differentially associated with psychological functioning.

Moreover, little is known about mechanisms underlying relationships between rumination and ED psychopathology. Impulsivity, and specifically negative urgency (i.e., responding rashly to negative affect), is one such potential mechanism. Both angry (Ciesla et al., 2011) and depressive (Valderrama, Miranda, & Jeglic, 2016) rumination are strongly correlated with negative urgency, and general negative rumination prospectively predicts increased negative urgency (Selby et al., 2008). Experimental evidence has also shown rumination to decrease self-control capacity, which is a related construct to negative urgency (Denson, Pedersen, Friese, Hahm, & Roberts, 2011). Negative urgency, in turn, prospectively predicts disordered eating in adolescents (Pearson, Combs, Zapolski, & Smith, 2012) and college students (Fischer, Peterson, & McCarthy, 2013). Thus, negative urgency may mediate associations between angry and depressive rumination and ED psychopathology. Individuals who continuously dwell on anger- or sadness-inducing experiences may be more likely to respond rashly to these unpleasant emotions, and engage in disordered eating behaviors to escape these negative thoughts and feelings (Heatherton & Baumeister, 1991).

The current pair of studies examined unique associations between angry and depressive rumination and ED psychopathology in nonclinical and clinical samples. We also examined negative urgency as a mechanism of these associations. Study 1 assessed these relationships longitudinally among a nonclinical sample of undergraduate students, and Study 2 examined these associations cross-sectionally in a mixed diagnostic group of treatment-seeking individuals with EDs. In both samples, we hypothesized that angry and depressive rumination would uniquely predict increased ED psychopathology. As ruminating on anger and sadness is associated with greater negative urgency, which is further associated with ED psychopathology, we also hypothesized that negative urgency would mediate these associations.

## 2. Study 1 method

### 2.1. Participants and procedure

Participants were 126 undergraduates recruited from a Psychology subject pool at a Northeastern college (Mage = 19.7, SDage = 1.1, 84% female) who completed the survey at baseline and five-month follow-up. Participants identified as White/Caucasian, (63.2%), Asian/Asian American (10.5%), Hispanic/Latino (7.9%), South Asian/Indian (5.8%), Black/African American (2.6%), Arab/Arab American (1.1%), American Indian/Native American (0.01%), multi-ethnic (4.2%), and “other” (0.2%). Seven participants indicated that they were diagnosed with an eating disorder at some point in their lives and were excluded from all analyses, resulting in a final sample of 119 participants.

Participants completed all questionnaires at baseline (time 1) and were compensated with course credit. Five months later (time 2), participants were informed of a follow-up study. If they agreed, participants completed the same measure of ED psychopathology and received course credit or a $5 gift card as compensation. All participants provided informed consent before completing the initial 30-minute online questionnaire. All measures were presented in a randomized order. The college’s Institutional Review Board (IRB) approved all research and recruitment procedures for Study 1.

### 2.2. Measures

#### 2.2.1. Anger rumination

The 19-item Anger Rumination Scale (Sukhodolsky et al., 2001) assessed unintentional and repetitive thoughts that occur during and after angering situations. Items are rated on a scale from 1 (almost never) to 4 (almost always). Higher averaged scores indicate more angry rumination. This scale has good internal consistency and test-retest reliability and correlates strongly with measures of anger experience and expression (Sukhodolsky et al., 2001). In the current sample, Cronbach’s alpha was 0.95.

#### 2.2.2. Depressive rumination

The 22-item Ruminative Responses Scale (Nolen-Hoeksema & Morrow, 1991) assessed repetitive thoughts about the causes and consequences of sad moods. Items are rated on a scale from 1 (almost never) to 4 (almost always). Higher averaged scores indicate more depressive rumination. Individuals with higher scores are more likely to become depressed (Nolen-Hoeksema & Morrow, 1991), and the scale correlates highly with measures of depressive symptoms (Roberts, Gilboa, & Gotlib, 1998). In the current sample, Cronbach’s alpha was 0.95.

#### 2.2.3. Negative urgency

The 12-item negative urgency subscale of the UPPS Impulsive Behavior Scale (Cyders et al., 2007) assessed emotion-based rash action. Items are rated on a scale of 0 (not at all) to 4 (very much). Higher averaged scores indicate higher impulsivity. UPPS subscales differentiate between individuals with borderline personality disorder, pathological gambling, alcohol abuse, and healthy controls (Whiteside, Lynam, Miller, & Reynolds, 2005). In the current sample, Cronbach’s alpha was 0.87.

#### 2.2.4. Eating-disorder psychopathology

The 28-item Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994) assessed ED psychopathology. Items are rated on a scale from 0 (no days) to 6 (every day). Higher averaged scores indicate greater ED psychopathology. The EDE-Q has shown strong validity (Berg, Peterson, Frazier, & Crow, 2012) and test-retest reliability (Rose, Vaesorn, Rosselli-Navarra, & Wilson, 2013). In the current sample, Cronbach’s alpha was 0.83 (time 1) and 0.90 (time 2).
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