



## Rumination and body dissatisfaction interact to predict concurrent binge eating

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### ARTICLE INFO

#### Article history:

Received 16 October 2011

Received in revised form 10 March 2012

Accepted 6 April 2012

#### Keywords:

Rumination

Body dissatisfaction

Binge eating

Escape theory

### ABSTRACT

Based upon the escape theory (Baumeister, 1991; Heatherton & Baumeister, 1991) and the emotional cascade model (Selby, Anestis, & Joiner, 2008), it was hypothesized that body dissatisfaction and rumination tendencies would interact to predict concurrent binge eating symptoms. This hypothesis was tested in a sample of 780 undergraduate students. The results conformed to prediction, in that individuals with high levels of body dissatisfaction were most likely to report binge eating behavior when they also had a tendency to ruminate. This interaction had a significant association with binge eating, above and beyond variance accounted for by participant sex, depression symptoms, and body mass index. Moreover, there was evidence of specificity for the model, as the interaction did not predict concurrent problematic drinking. Our findings suggest compatibility between the escape theory and emotional cascade models, and identify two factors that, in combination, may render individuals particularly vulnerable to binge eating.

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### Introduction

The *Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000)* defines binge eating as (1) eating an unusually large amount of food in a discrete period of time (e.g., 2 h) and (2) experiencing a lack of control while eating (e.g., feeling that one cannot stop eating). Approximately 4% of men and 5% of women experience recurrent binge eating during their lifetime (Hudson, Hiripi, Pope, & Kessler, 2007). Binge eating is associated with several negative health outcomes including obesity, mental disorders, suicide attempts, and impairment in professional, personal, and social domains (Hudson et al., 2007; Wonderlich, Gordon, Mitchell, Crosby, & Engel, 2009). It is important to identify factors that are associated with binge eating in order to understand and prevent this pernicious behavior. Informed by the escape theory (Baumeister, 1991), which has been applied to binge eating (Heatherton & Baumeister, 1991), and the emotional cascade model (Selby, Anestis, & Joiner, 2008), the current study tested the hypothesis that individuals with high levels of both body dissatisfaction and rumination would be particularly likely to engage in recurrent binge eating.

The escape theory (Baumeister, 1991) proposes that several maladaptive behaviors (e.g., alcohol use, suicide, binge eating) are

motivated by a desire to escape aversive self-awareness, which is an emotionally unpleasant state where one is aware of their failure to meet a valued standard. Specifically, Heatherton and Baumeister (1991) posit that the chain of events that leads to binge eating begins with individuals failing to meet a personal standard or goal. According to the theory, once people experience this type of failure, they enter into a state of aversive self-awareness about the perceived inadequacy, which leads to a negative mood. These negative mood states are theorized to drive individuals to binge eat as a means of focusing their attention away from their painful self-awareness and toward the physical sensations of eating (e.g., chewing, tasting). While the escape theory's application to binge eating states that the failure to meet any type of personal standard (e.g., career achievement) may trigger binge eating, there is a particular emphasis on standards related to body shape and weight (Heatherton & Baumeister, 1991). Indeed, failing to meet a personal ideal for body shape and weight (i.e., having body dissatisfaction) is consistently associated with concurrent binge eating symptoms (Antony, Johnson, Carr-Nangle, & Abel, 1994; Grilo, Masheb, Brody, Burke-Martindale, & Rothschild, 2005) and predictive of subsequent binge eating behavior (Johnson & Wardle, 2005; see Stice & Shaw, 2002 for a review).

The emotional cascade model is compatible with the escape theory and specifies that rumination plays a key role in the emotional dysregulation that precedes a variety of maladaptive coping behaviors including binge eating (Selby et al., 2008; Selby, Anestis, Bender, & Joiner, 2009). Rumination is a style of responding to stress that involves focusing on the feelings of distress, as well as potential causes and consequences of the distress, in a repetitive, passive

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manner (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Important in the context of the escape theory of binge eating, rumination is often self-focused (Treyner, Gonzalez, & Nolen-Hoeksema, 2003). Emotional cascades are posited to occur when an event triggers a negative emotion and the individual ruminates about the event, thereby increasing the intensity of the resultant negative emotion. The amplified emotion then purportedly leads to even greater levels of rumination, which lead to yet more intense negative feelings. This emotional cascade is proposed to continue gaining strength until the negative mood state is so powerful that engaging in an equally intense coping behavior (e.g., alcohol abuse, nonsuicidal self-injury, binge eating) is viewed as the only way to sufficiently distract oneself from the painful emotions. According to the model, less extreme coping strategies (e.g., talking to a friend, going for a walk) are not engaging enough to distract from these high intensity negative emotions.

There is evidence that individuals who tend to ruminate often report binge eating (sometimes studied in the context of bulimic behavior; Harrell & Jackson, 2008; Sarin & Nolen-Hoeksema, 2010; Selby et al., 2008, 2009). Greater tendencies to ruminate are predictive of future binge eating and the reverse is also true (i.e., binge eating is associated with greater future rumination tendencies; Holm-Denoma & Hankin, 2010; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Moreover, following a negative body image induction task, participants who ruminated reported significantly greater state body image dissatisfaction and anxiety than a comparison group who distracted themselves following the task (Etu & Gray, 2010). While rumination and the emotional cascade model are relevant to binge eating, it is worth noting that, like the escape theory, they are also related to other types of dysfunctional coping behaviors (e.g., problematic alcohol use; Nolen-Hoeksema et al., 2008; Selby et al., 2008).

In summary, consistent with escape theory, body dissatisfaction is associated with an increased likelihood of binge eating across multiple studies (Stice & Shaw, 2002). In addition, people who tend to ruminate are at elevated risk for binge eating (Nolen-Hoeksema et al., 2008), which is in line with the emotional cascade model. We proposed that these models are compatible, and that the key variable for each model interacts with the other, rendering certain individuals especially susceptible to binge eating. Specifically, within the frameworks of the escape theory, we conceptualized body dissatisfaction as a failure to meet a personal standard that would lead to aversive self-awareness. Consistent with the emotional cascade model, for individuals who have body dissatisfaction and who also tend to ruminate, the negative self-awareness should be magnified via emotional cascades. We hypothesized that the intensity of the negative self-awareness caused by the interaction of body dissatisfaction and rumination would drive individuals to seek escape from emotional distress through binge eating. To our knowledge, the potential interaction of these variables and their association with binge eating has never been tested.

We tested this interaction hypothesis in a cross-sectional sample of college undergraduate students. College students are particularly relevant for these hypotheses, as this age group reports among the highest rates of binge eating (Hudson et al., 2007). Because women have been found to have higher levels of rumination (Jose & Brown, 2008), body dissatisfaction (Cash, Morrow, Hrabosky, & Perry, 2004) and binge eating (Hudson et al., 2007) than men, we controlled for participant sex in our analyses. In addition, we controlled for depression symptoms and body mass index (BMI) to rule out the possibilities that statistically significant relationships between our variables could be explained by these potential confounding variables (e.g., that body dissatisfaction and/or rumination are associated with binge eating due to their relationships with depression, BMI, or participant sex; Nolen-Hoeksema et al., 2008; Wiederman & Pryor, 2000).

Our primary aim was to test the hypothesis that body dissatisfaction and rumination tendencies would interact to predict levels of concurrent binge eating, such that high body dissatisfaction and greater tendencies for rumination would be associated with greater levels of binge eating. As recommended by Treyner et al. (2003), we analyzed our data separately using two empirically and theoretically distinct facets of rumination: brooding and reflection. Reflection is more adaptive, emotionally neutral, and is “a purposeful turning inward to engage in cognitive problem solving to alleviate one’s depression symptoms” (Treyner et al., 2003, p. 256). Meanwhile, brooding is characterized as less adaptive, more negative affect-laden, and “a passive comparison of one’s current situation with some unachieved standard” (Treyner et al., 2003, p. 256). We viewed brooding as more relevant to the escape theory hypothesis about failing to meet a personal standard (in this case, failure to meet a body shape ideal). Therefore, it was hypothesized that the brooding facet of rumination would interact with body dissatisfaction in the prediction of concurrent binge eating, while the reflection facet of rumination would not. We predicted that this interaction between brooding and body dissatisfaction would remain significant in its association with binge eating even after controlling for participant sex, BMI, and depression symptoms.

Our secondary aim was to test the specificity of our proposed interaction by examining whether it predicted another concurrent maladaptive coping behavior that is not theoretically or empirically linked to body dissatisfaction, but that is linked to rumination. Problematic drinking was selected as an outcome variable because of its relevance to college students, who are in the age range for the highest rates of problematic drinking (Ham & Hope, 2003). Based upon previous research (Nolen-Hoeksema & Harrell, 2002), we hypothesized a main effect of brooding tendencies in the prediction of concurrent problematic drinking, but we did not predict a significant main effect of body dissatisfaction or that a significant body dissatisfaction by brooding interaction.

## Method

### Participants and Procedures

Participants were recruited from undergraduate, psychology courses at a public, Midwestern university. They completed the study in exchange for course credit. The sample consisted of 780 participants (65.7% female;  $n = 512$ ) with a mean age of 19.27 years ( $SD = 2.12$ ; age range = 18–38). The ethnic composition of the sample was 94.0% White ( $n = 735$ ), 1.7% Black/African-American ( $n = 13$ ), 1.2% Asian ( $n = 9$ ), 1.0% Hispanic/Latino ( $n = 8$ ), and 2.1% Other ( $n = 17$ ). All procedures were approved by the university’s internal review board, and the participants provided informed consent prior to participation. Participants completed all questionnaires through a secure online system.

### Measures

**Rumination.** The Ruminative Responses Scale (RRS; Treyner et al., 2003) is a self-report questionnaire that consists of 22 items. Participants were asked to indicate how often they engage in different rumination-related behaviors on a scale of 1 (*almost never*) to 4 (*almost always*). As mentioned above, Treyner et al. (2003) found support for a two-factor model for the scale and therefore suggested that it should be broken down into two subscales: Reflection and Brooding. The Reflection subscale includes items such as, “Go some place alone to think about your feelings.” Meanwhile, the Brooding subscale includes items such as, “Think ‘why do I have problems other people don’t have?’” The Brooding and Reflection subscales have good validity and reliability (Treyner et al., 2003). Cronbach’s

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