



# Eating pathology, emotion regulation, and emotional overeating in obese adults with binge eating disorder<sup>☆</sup>



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## ABSTRACT

**Objective:** The purpose of the current study was to examine the relationship among emotional regulation, emotional overeating, and general eating pathology in a treatment seeking sample of adults with Binge Eating Disorder (BED).

**Method:** The sample was composed of 326 adults (248 women, 78 men) who were obese and met DSM-IV-TR criteria for BED. Prior to treatment, participants completed the Difficulties in Emotion Regulation Scale (DERS), Emotional Overeating Questionnaire (EOQ), Beck Depression Inventory (BDI), and Eating Disorder Examination-Questionnaire (EDE-Q) as part of a larger assessment battery.

**Results:** A series of hierarchical regression analyses indicated that difficulties with emotion regulation accounted for unique variance in both emotional overeating and general eating pathology above and beyond sex and negative affect.

**Discussion:** Emotion regulation may play a significant role in the maintenance of emotional overeating and eating pathology in obese adults with BED.

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## 1. Introduction

A predominant theoretical model for explaining disordered eating behaviors suggests that these behaviors are undertaken as an attempt to regulate or escape from negative affect (Heatherton & Baumeister, 1991; Stice et al., 2001). Past research suggests that many individuals who struggle with excess weight or have an eating disorder also engage in a maladaptive behavior termed emotionally-driven eating, which is eating in response to emotions (Goossens, Braet, Van Vleirberghe, & Mels, 2009; Masheb & Grilo, 2006; Ricca, Castellini, Lo Sauro, et al., 2009). Negative affect is one of the most commonly reported precipitants of binge eating episodes (Polivy & Herman, 1993) and a meta-analytic review examining studies implementing ecological momentary assessment (EMA) demonstrates that increases in negative affect often precede binge episodes in individuals with binge eating disorder (BED) and bulimia nervosa (Haedt-Matt & Keel, 2011). Experimentally-induced negative affect is also associated with binge eating and loss-of-control eating in laboratory settings in obese women with BED (Agras & Telch, 1998; Chua, Touyz, & Hill, 2004).

It has been hypothesized that individuals with eating disorders are vulnerable to engaging in emotional overeating because they lack

adaptive emotion regulation strategies and skills, including being able to clearly identify and adaptively cope with emotional states (Sim & Zeman, 2006; Wisner & Telch, 1999). Compared to healthy controls, individuals with anorexia nervosa and bulimia nervosa report more difficulties with emotion regulation, although there is not yet evidence demonstrating a causal relationship between emotion regulation difficulties and disordered eating behaviors in these groups (Harrison, Sullivan, Tchanturia, & Treasure, 2010). Initial studies suggest that emotion regulation difficulties explain a significant portion of the variance of binge eating behaviors in a non-clinical college sample and a non-clinical sample of children (Czaja, Reif, & Hilbert, 2009; Whiteside et al., 2007).

Binge eating disorder is found in between 1 and 3% of the population, with the prevalence increasing to approximately 8% in overweight and obese samples (Bruce & Agras, 1992; Spitzer, Devlin, Walsh, et al., 1992). Among overweight and obese samples seeking weight loss treatment, the prevalence of BED is between 20% and 30% (Striegel-Moore & Franko, 2003). A substantial body of literature suggests that individuals with BED report overeating in response to emotions (Eldredge & Agras, 1996; Masheb & Grilo, 2006; Stein et al., 2007). There have been a number of trials examining the efficacy of treatments for BED which focus on developing adaptive emotion regulation skills, with the intent of reducing emotional overeating (Robinson, 2012; Telch, Agras, & Linehan, 2001). It is important to better characterize the relationship between emotion regulation difficulties and disordered eating behaviors within a sample of adults with BED, as this may provide us with valuable information regarding appropriate points of intervention for these individuals.

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The purpose of the current study was to determine whether emotion regulation difficulties significantly contributed to emotional overeating and general eating disorder pathology in a clinical sample of obese, treatment-seeking adults with BED after accounting for sex and negative affect. We hypothesized that emotion regulation difficulties would explain unique variance in both emotional overeating and general eating disorder pathology. Furthermore, we sought to examine what specific types of emotion regulation difficulties would significantly account for variance in these two outcome variables.

## 2. Method

### 2.1. Participants

Participants were a consecutively evaluated series of 326 treatment-seeking obese (body mass index [BMI; kg/m<sup>2</sup>] ≥ 30) adults (78 men and 248 women) who met DSM-IV research criteria for BED. Exclusionary criteria were any concurrent treatment for weight or eating, medical conditions (uncontrolled diabetes, cardiac abnormalities, thyroid problems) that might influence weight or eating, pregnancy, and severe psychiatric conditions (psychosis, bipolar disorder, substance dependence, or suicidality). Written informed consent was obtained from all participants. Participants ranged in age from 19 to 65 (Mean = 45.49 ± 10.52) and self-reported racial and ethnic background of participants was 21.2% Black (*n* = 69), 6.7% Hispanic (*n* = 22), 67.2% White (*n* = 219), 0.9% Asian (*n* = 3), and 4.0% Other (*n* = 13). Educationally, 23.1% (*n* = 75) of participants reported a high school education or less, 31.0% (*n* = 101) attended some college, and 45.7% (*n* = 149) graduated from college. The mean BMI was 38.3 (±6.2).

### 2.2. Materials

#### 2.2.1. Emotional Overeating Questionnaire (EOQ; Masheb & Grilo, 2006)

This instrument is a nine-item self-report questionnaire which measures overeating in response to emotions. Each item begins with, "Have you eaten an unusually large amount of food given the circumstances in response to feelings of..." Each of the nine emotions is presented in all capital letters, followed by three more synonyms in parentheses and in lower case, for example: "ANXIETY (worry, jittery, nervous)". The response set for the nine items is a 7-point scale reflecting the frequency of days in which the behavior occurred in the past 28 days (i.e., 0 = no days, 1 = 1–5 days, 2 = 6–12 days, 3 = 13–15 days, 4 = 16–22 days, 5 = 23–27 days, and 6 = every day). The total score is obtained by taking an average of the 9 items, for a possible range of 0 to 6. The EOQ has one item which measures eating in response to feeling "happy". In the current study we were interested in eating in response to negative affect only and thus created a new total score (EOQ: Negative Affect) by taking an average of the 8 negative affect items. In the current investigation, Cronbach's alpha was .86.

#### 2.2.2. Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994)

The EDE-Q is a 32-item self-report measure of eating disorder behaviors and attitudes based on the Eating Disorder Examination interview (EDE; Fairburn & Cooper, 1993). The EDE-Q comprises four subscales, including Dietary Restraint, Weight Concern, Shape Concern, and Eating Concern. A total score comprised of these subscales can also be created (Total EDE-Q). There is empirical support for use of the EDE-Q in populations with BED (Grilo, Masheb, & Wilson, 2001). In the current investigation, Cronbach's alpha for the total score was .85 and .60–.73 for the subscales.

#### 2.2.3. Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

This instrument is a 36-item questionnaire that measures multiple dimensions of emotion regulation, including emotional understanding

and clarity, and controlling behavior when in a state of heightened emotional arousal. Each item asks participants to rate how frequently each statement applies to them and items are rated on a five-point scale from "almost never (0–10%)" to "almost always (91–100%)". The DERS yields a total score (Total DERS) and six subscales: Non-acceptance of Emotional Responses; Difficulties Engaging in Goal-Directed Behavior; Impulse Control Difficulties; Lack of Emotional Awareness; Limited Access to Emotion Regulation Strategies; and Lack of Emotional Clarity. In the current investigation, Cronbach's alpha for the total score was .87, and .74–.89 for the subscales.

#### 2.2.4. Beck Depression Inventory (BDI; Beck & Steer, 1987)

This instrument is a 21-item version that assesses the cognitive, affective, and somatic symptoms of depression. The BDI assesses a wide range of negative affect, not just depressive affect (Watson & Clark, 1984), a finding that has been noted for self-report measures of depression (Fechner-Bates, Coyne, & Schwenk, 1994). Cronbach's alpha for the current sample was .90.

This research was reviewed and approved by the Yale University School of Medicine's Institutional Review Board and all participants signed a written, voluntary informed consent form. All assessments were completed at baseline, before participants entered treatment.

## 3. Results

### 3.1. Emotional overeating, general eating pathology, and emotion regulation difficulties

Table 1 provides means and standard deviations for the total scores and subscale scores for all variables. Hierarchical regression was used to determine whether emotion regulation difficulties explained unique variance in emotional overeating and general eating pathology above and beyond sex and negative affect. For the first regression EOQ: Negative Affect, our measure of emotional overeating in response to negative affect, was regressed on Sex at Step 1. Negative affect, as measured by the BDI, was added at Step 2. Finally, emotion regulation difficulties, as operationalized by the DERS total score, were added at Step 3. Table 2 presents these regression results. For the second regression, Global EDE-Q, our measure of general eating pathology, was regressed on Sex at Step 1, with BDI and DERS total score added at Steps 2 and 3 respectively. Table 3 presents these regression results.

Results revealed that participant sex (Sex) at Step 1 uniquely explained 3.2% of the variance in emotional overeating and 5.5% of the variance in general eating pathology. At Step 2, negative affect (BDI) accounted for 20% of variance in emotional overeating and 17.7% of variance in general eating pathology. At Step 3, emotion regulation difficulties (Total DERS) accounted for 2.2% of variance in emotional

**Table 1**  
Means and standard deviations for total scales and subscales.

Scales and subscales	<i>M</i>	<i>SD</i>
Global EDE-Q	3.41	0.93
EDE-Q: Eating Concern	3.14	1.43
EDE-Q: Shape Concern	4.56	1.00
EDE-Q: Weight Concern	3.99	1.05
EDE-Q: Dietary Restraint	1.97	1.33
EOQ: Negative Affect	2.11	1.34
BDI	16.18	9.17
DERS total	82.31	24.07
DERS Non-acceptance	12.09	5.21
DERS Goals	13.27	4.90
DERS Impulse	12.71	5.16
DERS Awareness	16.77	5.45
DERS Strategies	16.85	7.01
DERS Clarity	10.62	3.84

Note. *N* = 326; EDE-Q = eating disorder examination-questionnaire; EOQ: Negative Affect = emotional overeating questionnaire; negative affect; BDI = Beck depression inventory; DER = difficulties in emotion regulation scale.

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