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Eating Pathology, Emotion Regulation, and Emotional Overeating in Obese Adults with Binge Eating Disorder

Loren M. Gianini, Ph.D., Marney A. White, Ph.D., M.S., and Robin M. Masheb, Ph.D.*

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.

Keywords

Binge Eating; Obesity; Emotion Regulation; Emotional Overeating

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, Agras, Telch, Halmi, Mitchell & Wilson, 2001).

Past research suggests that many individuals who struggle with excess weight, carry eating

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*Correspondence to: Robin M. Masheb, Ph.D., Department of Psychiatry, Yale University School of Medicine, 301 Cedar Street, P.O. Box 208098, New Haven, CT 06520-8090, robin.masheb@yale.edu.

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Gianini participated in manuscript preparation, data analysis, and data collection. Masheb participated in the design of the study and manuscript preparation, and also supervised data collection. White participated in manuscript preparation and also supervised data collection. All authors contributed to and have approved the final manuscript.

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disorder diagnoses, or engage in many types of disordered eating behaviors 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; Wiser & 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 (Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007; Czaja, Reif, & Hilbert, 2009).

Binge eating disorder is found in between 1–3% 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, Kenardy, Wiseman, Zoler Douchis, Arnou, & Wilfley, 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.

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/m²] ≥ 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 19–65 (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 $38.3 (\pm 6.2)$.

2.2 Materials

2.2.1 Emotional Overeating Questionnaire EOQ; (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 EQO: 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, was 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 overeating and 1.5% of variance in general eating pathology. Taken together, the three predictor variables accounted for 25% of the variance within emotional overeating and 24% of the variance within general eating pathology.

3.2 Emotional Overeating, General Eating Pathology, and Specific Types of Emotion Regulation Difficulties

Multiple regression was then implemented to identify how specific emotion regulation difficulties are uniquely related to emotional overeating and general eating pathology. First, EQO: Negative Affect was regressed on the six DERS subscales. Results from these analyses can be found in Table 4. The combination of the six subscales accounted for 21% of the variance in emotional overeating, $F(6, 305) = 13.77, p < .001$. Two DERS subscales,

measuring limited access to emotion regulation strategies (Strategies) and lack of emotional clarity (Clarity) uniquely predicted emotional overeating. Next, Global EDE-Q was regressed on the six DERS subscales. Results from these analyses can be found in Table 5. The combination of the six subscales accounted for 19% of the variance in general eating pathology, $F(6, 313) = 12.24, p < .001$. Two DERS subscales, measuring nonacceptance of emotional responses (Nonacceptance) and difficulties engaging in goal-directed behavior (Goals) uniquely predicted general eating pathology.

4. DISCUSSION

The primary purpose of this study was to examine the relationships between emotion regulation difficulties, emotional overeating, and eating pathology in a treatment-seeking sample of obese adults with binge eating disorder. As hypothesized, difficulties with emotion regulation were found to be independently associated with emotional overeating and general eating pathology above and beyond the contribution of sex and negative affect. These results are consistent with previous findings in non-clinical samples (Lavender & Anderson, 2010; Whiteside et al., 2007).

Emotion regulation difficulties contributed unique variance to our measure of emotional overeating. Specifically, limited access to emotion regulation strategies and lack of emotional clarity were the emotion regulation difficulties most strongly associated with emotional overeating. The cross-sectional nature of our data precludes making causal influences; however, our results are consistent with what one might expect in a negative affect regulation model for disordered eating which suggests that individuals overeat as an attempt to regulate and assuage the emotions they are feeling. Our results suggest that when obese individuals with BED experience negative affect they may lack effective strategies for managing these emotions. It may also be the case that these individuals experience extremely high levels of negative affect and typically functional strategies for coping with these emotions do not work. The mean negative affect score in the current sample coincides with a moderate level of depression or negative affect; however, the intensity of emotions immediately preceding an emotional overeating episode is not known. It is possible that eating is undertaken as a strategy to regulate or change negative emotions. Furthermore, a lack of emotional clarity, or inability to determine what emotion is being felt, was associated with emotional overeating in this sample. These results are also consistent with results found in non-clinical samples demonstrating a relationship between eating disorder symptoms and lack of emotional clarity (Sim & Zeman, 2005). Being able to accurately identify the emotions one is feeling is essential before being able to effectively cope with said emotions.

Nonacceptance of emotional responses and difficulties engaging in goal-directed behavior were the emotion regulation difficulties most strongly associated with eating pathology. Prior studies in clinical samples have found non-acceptance of emotional response to be linked to some forms of disordered eating symptoms (Merwin, Zucker, Lacy, & Elliott, 2010). The relationship found between difficulty engaging in goal-directed behaviors in the face of negative affect and general eating pathology may also lend indirect support for a negative affect regulation model of disordered eating. It is possible that when individuals feel as though they are overwhelmed by negative affect and cannot concentrate or attend to

other tasks at hand, they engage in disordered eating as an attempt to mitigate or escape from these aversive emotional states.

The current results were found in a clinical sample of treatment-seeking individuals with BED; however, relationships between affect, emotion regulation, and disordered eating behaviors have also been found in subthreshold, non-clinical populations, and in many ways mirror the results found in the current study (Burns, Fischer, Jackson, & Harding, 2012; Evers, Stok, de Ridder, 2010; Sulkowski, Dempsey, & Dempsey, 2011; Whiteside et al, 2007). When considering the mounting evidence for the role of emotion regulation difficulties in the maintenance of disordered eating in both clinical and non-clinical populations, and the current surge in the use of treatments focused on emotion regulation on disordered eating, continued basic research is needed to further characterize these relationships.

We hypothesize that interventions such as Dialectical Behavior Therapy (DBT) for BED may be useful in this aim (Safer, Robinson & Jo, 2010; Telch, Agras, & Linehan, 2001). Interpersonal Psychotherapy (IPT) may also be useful in indirectly addressing difficulties with emotion regulation in this population, as it helps individuals develop and implement effective strategies for managing social roles and effectively adapt to interpersonal situations, thus reducing negative affect associated with interpersonal difficulties which are often elevated in individuals with BED (Grilo, Wilfley, Jones, Brownell, & Rodin, 1994; Wilfley, Welch, Stein, et al., 2002).

There are several potential limitations to the current study. Our measure of emotional overeating was based upon retrospective recall of the past 28 days and therefore we cannot conclude participants were accurate and that these emotions did immediately precede episodes of overeating. Furthermore, we cannot establish temporal precedence for the variables within the models tested in the current study because they were all measured at the same time point. Laboratory studies specifically assessing experimentally-induced negative affect, emotion regulation strategies, and eating behavior will be needed to further explore this research question.

Future studies should investigate the impact of treatment for BED on emotional overeating and on emotion regulation difficulties. Studies should also compare the effectiveness of standard treatments for BED (behavioral weight loss and cognitive behavioral therapy) versus others which have a more specific focus on emotions, such as Dialectical Behavior Therapy or Enhanced Cognitive Behavioral Therapy (CBT-E; Fairburn, Cooper, & Shafran, 2008), in their impact on emotion regulation and emotional overeating.

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Highlights

- We examine the relationship between emotion regulation and emotional eating.
- Emotional eating and emotion regulation difficulties are positively correlated.
- Emotional eating is partially accounted for by emotion regulation difficulties.

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 Nonacceptance	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.

Table 2

Hierarchical regression analysis predicting emotional overeating as a function of sex, negative affect, and emotion regulation difficulties.

Variable	B	SE B	β
Step 1			
Sex	.57	.18	.18**
Step 2			
Sex	.35	.16	.11*
Negative Affect	.07	.01	.45***
Step3			
Sex	.34	.16	.11*
Negative Affect	.05	.01	.31***
Emotion Regulation Difficulties	.01	.00	.21**

Note. $N=326$; $R^2=.032$ for Step 1; $R^2=.200$ for Step 2; $R^2=.022$ for Step 3.

*
 $p<.05$;

**
 $p<.01$;

 $p<.001$.

Table 3

Hierarchical regression analysis predicting disordered eating pathology as a function of sex, negative affect, and emotion regulation difficulties.

Variable	B	SE B	β
Step 1			
Sex	.51	.12	.23***
Step 2			
Sex	.37	.12	.17**
Negative Affect	.04	.01	.43***
Step 3			
Sex	.36	.11	.17**
Negative Affect	.03	.01	.31***
Emotion Regulation Difficulties	.01	.00	.17*

Note. $N=326$; $R^2=.055$ for Step 1; $R^2=.177$ for Step 2; $R^2=.015$ for Step 3.

*
 $p<.05$;

**
 $p<.01$;

 $p<.001$.

Table 4

Multiple regression analysis predicting emotional overeating as a function of DERS subscales.

Variable	B	SE B	β	<i>t</i>
Nonacceptance	.02	.02	.09	1.25
Goals	-.01	.02	-.05	-0.59
Impulse	.02	.02	.07	0.85
Awareness	-.01	.02	-.06	-0.81
Strategies	.06	.02	.29	2.87**
Clarity	.06	.03	.17	2.08*

Note. *N*= 326.

*
p<.05;

**
p<.01;

p<.001.

Table 5

Multiple regression analysis predicting disordered eating pathology as a function of DERS subscales.

Variable	B	SE B	β	<i>t</i>
Nonacceptance	.04	.01	.22	2.92**
Goals	.03	.02	.17	2.24*
Impulse	-.01	.01	-.05	-.57
Awareness	-.01	.01	-.02	-.25
Strategies	.01	.01	.08	.79
Clarity	.03	.02	.11	1.41

Note. *N*= 326.

*
p<.05;

**
p<.01;

p<.001.