

A Double Burden: Emotional Eating and Lack of Cognitive Reappraisal in Eating Disordered Women

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Abstract

Objective: To examine the influence of emotional eating and lack of cognitive reappraisal on eating pathology in women with binge-purge and restricting type eating disorders.

Method: Women with a diagnosis of anorexia or bulimia nervosa according to the DSM-IV-tr ($n = 50$) and non-clinical women without eating disorders ($n = 52$) were asked about emotional eating tendencies, adaptive emotion regulation strategies (cognitive reappraisal) and eating pathology symptoms.

Results: In binge-purging women, emotional eating with limited use of cognitive reappraisal predicted level of eating pathology but not in the restricting and non-clinical women.

Discussion: Emotional eating tendencies in combination with a low tendency to use cognitive reappraisal may influence the severity of eating pathology in individuals with binge-purge behaviours. Evidently, patients with these characteristics require a therapy that addresses adaptive emotion regulation skills. Copyright © 2012 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords

eating disorders; emotion regulation; cognitive reappraisal; emotional eating; binge-purging

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Introduction

Negative emotions and maladaptive emotion regulation are considered important maintenance factors in eating disorders (ED) (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Harrison, Sullivan, Tchanturia, & Treasure, 2010). The relationship between emotions and pathological eating behaviour is a well-recognized one, and numerous studies have provided evidence that binge events in both bulimia nervosa (BN) and binge eating disorder (BED) are preceded by the experience of negative emotions (Agras & Telch, 1998; Haedt-Matt & Keel, 2011; Hilbert & Tuschen-Caffier, 2007). Binging may be considered an extreme form of emotional eating, because the emotion gives rise to disordered eating (Smyth *et al.*, 2007; van Strien, Frijters, Bergers, & Defares, 1986).

An often mentioned explanation for disordered eating in response to emotional events is that individuals with ED lack the ability to regulate emotions effectively and therefore apply alternative strategies to diminish their negative feelings (Heatherton & Baumeister, 1991). For example, Heatherton and Baumeister (1991) propose that binge eating is motivated by a desire to escape from unpleasant states such as aversive self-awareness. It is thought that emotional states increase the desire to eat (Alpers & Tuschen-Caffier, 2001) and when the emotional state is not reduced, individuals with ED have a binge episode as an attempt

to regulate the emotional states or to seek temporary relief (Deaver, Miltenberger, Smyth, Meidinger, & Crosby, 2003). Thus, when individuals with ED experience negative feelings they are unable to regulate effectively, they employ the accessible yet maladaptive strategy of emotional eating, which in this group often results in binge/purging behaviours (Evers, Stok, & de Ridder, 2010).

Research has shown that individuals with ED indeed have maladaptive emotion regulation strategies that are related to the severity of the eating disorder symptomatology (Forbush & Watson, 2006; Harrison *et al.*, 2010). Importantly however, it has hardly been investigated to what extent individuals with ED lack *adaptive* emotion regulation strategies and how the relative absence of such adaptive strategies is related to the level of ED symptomatology. A prototypical adaptive emotion regulation strategy that is commonly used in daily life is *cognitive reappraisal* (Gross & John, 2003; Richards & Gross, 2000). Cognitive reappraisal entails changing the way a situation is construed so as to decrease its emotional impact. It often takes place before an emotional situation occurs, and once the situation occurs, its emotional impact reduces. As cognitive reappraisal is so prototypical for adaptive emotion regulation (e.g. Aldao *et al.*, 2010), this strategy will be the focus of the current study.

Aldao *et al.* (2010) conducted a meta-analysis to examine emotion regulation strategies in four different types of psychopathology

including ED. It seems that individuals turn towards pathological behaviours because these may be momentarily beneficial in the absence of effective strategies. A small effect size was found for lack of adaptive emotion regulation strategies (including cognitive reappraisal) in relation to ED, and the authors theorized that eating behaviour in itself may serve as an emotion regulator, and hence, individuals suffering from ED may therefore lack the use of other (adaptive) regulation strategies. The mere presence of maladaptive emotion regulation strategies such as emotional eating, will likely add to the severity of ED symptoms. That is, individuals who are both hampered by emotional eating tendencies and are lacking the use of adaptive strategies are those most likely to suffer from pathological eating behaviour. A major limitation of this meta-analysis is that it does not differentiate between ED types. Emotional eating seems particularly linked to binge-purge behaviour. Individuals of the binge-purging subtype of anorexia nervosa (AN) (American Psychiatric Association, 2000) also display bulimic *type* behaviours (e.g., binge episodes, in particular in negative states). These individuals further resemble BN individuals in the use of emotion regulation strategies (Claes, Vandereycken, & Vertommen, 2005). AN binge-purging subtype is therefore different from the AN restricting subtype (e.g. Vervaet, van Heeringen, & Audenaert, 2004), and emotions in individuals with the restricting subtype will trigger restricted eating behaviour rather than binge eating. Taken together, it seems that emotional eating primarily manifests itself in binge-purge type eating disorders.

Because AN and BN tend to affect more women than men, the sample used in the present study will consist of only women. In order to test whether findings in this study are specific to individuals with ED, we included a control group of women who are comparable in age and education and had no history of ED.

Because symptoms of depression are often highly related to binge eating and emotional eating, depression level was included as control variable (Stice, Presnell, & Spangler, 2002).

We aim to examine the relationship between cognitive reappraisal and emotional eating in the context of eating pathology. To do so, we will differentiate between different (sub)types of disordered eating. In particular, we will focus on the low tendency to use cognitive reappraisal and its influence on the relationship between emotional eating and eating pathology in binge-purging individuals and in restricting individuals. We hypothesize to find a moderation effect of emotional eating and cognitive reappraisal in the prediction of eating pathology in binge/purge women but not in restrictive and non-clinical women.

Method

Participants

Fifty female patients who met DSM-IV criteria for ED and 52 women without an eating disorder participated in the study. All participants were 18 years of age or older (with an age range of 18 to 28 years, *Mean* = 21.63, *SD* = 2.66), were fairly educated (most participants already finished advanced education (at least bachelor level or applied sciences. Participants were asked to report their highest completed level of education with 1 = 'primary school' to 7 = 'university') or were at present receiving advanced education) and had on average a low to normal body mass index (BMI; Table 1).

Patients were recruited at a specialized centre for ED in the Netherlands. On the basis of their DSM-IV diagnoses, they were

Table 1 Mean and SD for the restrictive and binge-purging patient groups and the non-clinical group regarding demographics (age, highest completed level of education and BMI) and clinical and personality characteristics (depression, cognitive reappraisal, emotional eating and eating disorder symptoms)

	Restrictive		Binge-purging		Non-clinical		<i>F</i>	<i>p</i>	η_p^2
	<i>n</i> = 20		<i>n</i> = 30		<i>n</i> = 52				
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			
Age	21.05	3.15	21.67	2.32	21.83	21.09	0.62	.54	.01
Education	5.00	1.65	5.27	1.46	5.60	1.27	1.44	.24	.03
BMI ^a	17.58	2.16	19.81	2.18	22.71	3.72	22.25	<.001	.31
BDI ^a	25.20	14.55	28.13	12.17	9.56	8.47	32.34	<.001	.40
Depression									
ERQ ^b	4.53	1.28	3.72	1.20	4.16	1.05	3.13	.048	.06
Reappraisal									
DEBQ ^c	1.93	0.83	3.24	0.96	3.00	0.66	18.01	<.001	.27
Emotional eating									
EDDS ^d	29.50	12.22	39.33	15.14	20.33	10.46	22.85	<.001	.32
symptoms									

Note:

^aPost hoc test indicated that both patient groups differ from the non-clinical group.

^bPost hoc test indicated that restrictive and binge-purging groups differ.

^cPost hoc test indicated that the restrictive group differs from the binge-purging and non-clinical groups.

^dPost hoc test indicated that all groups differ.

BMI, body mass index; BDI, Beck Depression Inventory; ERQ, Emotion Regulation Questionnaire; DEBQ, Dutch Eating Behaviour Questionnaire; and EDDS, Eating Disorders Diagnostic Scale.

divided in a restricting (AN or EDNOS-AN restricting subtype; $n = 20$) and a binge-purging group (AN or EDNOS-AN binge-purging subtype ($n = 17$) or BN or EDNOS-BN ($n = 13$); in total $n = 30$). ED diagnoses were ascertained by ED experts (all medical doctors).

Non-clinical participants were recruited via several health-related websites and an internet site of a national newspaper. They were presented with a link inviting all female visitors to participate in the study. Age and level of education of non-clinical participants was matched to that of the patients. Non-clinical participants were only included if they were not previously diagnosed with ED, believed that they had never suffered from ED and did not have ED as assessed by the Eating Disorders Diagnostic Scale (Stice, Telch, & Rizvi, 2000).

All participants were thoroughly informed about the research procedure and provided with informed consent. The study was approved by the Committee Scientific Research of Altrecht Mental Health Institute.

Assessments and procedure

Emotion Regulation Questionnaire—cognitive reappraisal

The Dutch translation (Koole, 2004) of the cognitive reappraisal subscale of the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) was used to measure individual differences in the use of cognitive reappraisal. It contains six items (e.g., 'I control my emotions by *changing the way I think* about the situation I'm in'). Items are presented as statements and participants indicate how much they agree on 7-point Likert scales ranging from 1 'strongly disagree' to 7 'strongly agree'. The ERQ shows good reliability and convergent as well as discriminant validity (Gross & John, 2003).

Emotional eating

Individual differences in emotional eating were assessed using the Emotional Eating subscale of the Dutch Eating Behaviour Questionnaire (EE-DEBQ; van Strien *et al.*, 1986). The EE-DEBQ scale has high reliability, good validity and high convergent and discriminative validity (van Strien, 2005). The EE-DEBQ consists of 13 items using 5-point scales ranging from 'never' to 'very often'. Example items are 'Do you have a desire to eat when you are anxious, worried or tense?' and 'Do you crave for food when you are angry?'

Eating disorder diagnostic scale

The Eating Disorder Diagnostic Scale (EDDS; Stice *et al.*, 2000) is a brief measure for diagnosing AN, BN and BED and for generating a continuous ED symptom composite. Its reliability and validity have been demonstrated (Stice, Fisher, & Martinez, 2004). The EDDS contains 22 items assessing *DSM-IV* symptoms for all three ED. This composite reflects the participant's overall level of eating pathology. The validity of the Dutch version of the EDDS was recently demonstrated (Krabbenborg *et al.*, 2011). The items are related to body dissatisfaction, binge eating, experience of loss of control, compensatory behaviour and menstruation. The EDDS diagnoses were used to preclude ED in the non-clinical group, and the EDDS symptom composite was used for all participants to determine overall level of eating pathology (control

participants may also show minor signs of eating pathology symptoms such as a certain degree of body dissatisfaction or dieting).

Beck depression inventory

The Beck Depression Inventory (BDI-II; Beck, Steer, Ball, & Ranieri, 1996) is a widely used self-report inventory for measuring the severity of depression. The validity of the Dutch version is good (Schotte, Maes, Cluydts, De Doncker, & Cosyns, 1997). The BDI-II contains 21 questions, each answer being scored on a scale value of 0 to 3. Higher total scores indicate more severe depressive symptoms.

Cronbach's alphas of all questionnaires in this study were acceptable, all $>.82$.

Procedure

Following consent, all participants received an internet link by email with a unique code that allowed them to visit the questionnaire online. The questionnaire consisted of all consecutive measurements and was programmed using Netquestionnaires. Every measurement started with a separate brief introduction.

Data analyses

The data were analyzed with SPSS version 16.0 (SPSS Inc., Chicago, Illinois, USA). Analyses of variance (ANOVA) were used to compare descriptive information of demographics and clinical characteristics between the three groups (restricting, binge-purging and non-clinical women). Prior to the main regression analysis, z -scores were calculated for the variables cognitive reappraisal and emotional eating. In the analyses, we controlled for BMI and depression severity.

To examine the level of eating pathology between groups, we conducted a regression analysis with the General Linear Model with group, cognitive reappraisal, and emotional eating as predictors while controlling for BMI and depression severity. Further interpretation of interaction effects was carried out within the group using a three-step hierarchical regression analysis. The first two steps were control steps (BMI and depression level in Step 1 and the main effects of emotional eating and cognitive reappraisal in Step 2). The interaction of emotional eating \times cognitive reappraisal was entered in Step 3. To interpret the interaction further, we computed simple regression slopes of high and low cognitive reappraisal at weak and strong levels of emotional eating (Cohen, Cohen, West, & Aiken, 2003). Scores one standard deviation above and below the mean were estimated to identify the levels of emotional eating and cognitive reappraisal to use in the regressions. This allowed us to test the slope of the relation between cognitive reappraisal and overall level of eating pathology for patients with relatively weaker (low score) and stronger (high score) emotional eating.

Results

Preliminary results

The descriptive statistics as well as the correlations between the various measures (ERQ-R, DEBQ-EE and EDDS symptoms composite) for each group are presented in Tables 1 and 2. The

restricting group reported less emotional eating than the other groups, and the binge-purging group had lower cognitive reappraisal scores than the restricting group. For the binge-purging and the non-clinical group, there was a positive and strong correlation between overall level of eating pathology and both emotional eating and depression scores. There was no correlation between eating pathology and cognitive reappraisal. In the restricting group, overall level of eating pathology was also positively related to depression but not to emotional eating. In addition, a higher depression level was related to lower cognitive reappraisal.

Influence of cognitive reappraisal and emotional eating on overall level of eating pathology

There was a main effect of group, $F(2, 86) = 7.79, p = .001, \eta_p^2 = 0.15$ and a main effect of emotional eating, $F(2, 86) = 14.86, p < .001, \eta_p^2 = 0.15$, on the overall level of eating pathology. There was no main effect of cognitive reappraisal, $F(1, 86) = 0.001, p = .98, \eta_p^2 = 0.00$. The three-way interaction between group, emotional eating and cognitive reappraisal was not significant $F(3, 86) = 2.08, p = .11, \eta_p^2 = 0.07$. As we only predicted an interaction between emotional eating and cognitive reappraisal in the binge-purge group, this ANOVA interaction term provides an overly conservative test of our hypothesis (Rosnow & Rosenthal, 1995). Parameter estimates indeed showed that the interaction between emotional eating and cognitive reappraisal was significant in the binge-purging group ($t = -2.31, p = .023, \eta_p^2 = 0.06$) and not in the restricting ($t = -0.88, p = .38, \eta_p^2 = 0.01$) or the non-clinical ($t = 0.32, p = .75, \eta_p^2 = 0.001$) groups.

Table 2 Correlations for the restrictive ($n = 20$), binge-purging ($n = 30$) and non-clinical ($n = 52$) groups separately between overall level of eating pathology (EDDS Sym), cognitive reappraisal (ERQ-R), emotional eating (DEBQ-EE) and level of depression (BDI)

	EDDS-Sym	ERQ-R	DEBQ-EE	BDI
Restricting				
EDDS-Sym		-.04	-.10	.48*
ERQ-R	-.04		.18	-.49*
DEBQ-EE	-.10	.18		-.43
BDI	.48*	-.49*	-.43	
Binge-purging				
EDDS-Sym		-.33	.61**	.37*
ERQ-R	-.33		-.06	-.20
DEBQ-EE	.61**	-.06		.09
BDI	.37*	-.20	.09	
Non-clinical				
EDDS-Sym		.24	.49**	.35*
ERQ-R	.24		-.01	.11
DEBQ-EE	.49**	-.01		-.03
BDI	.35*	.11	-.03	

Note:

EDDS, Eating Disorders Diagnostic Scale; ERQ, Emotion Regulation Questionnaire; DEBQ, Dutch Eating Behaviour Questionnaire; and BDI, Becks Depression Inventory.

* $p < .05$,

** $p < .001$.

A post hoc test using a hierarchical regression analysis in the binge-purging group showed that the interaction between emotional eating and reappraisal was significant, unstandardized regression coefficient (B) = $-4.04, R^2$ change = $.07, F = 4.88, p = .038$. The analysis (Figure 1) showed that the slope for cognitive reappraisal—overall eating pathology relationship was significant when emotional eating was strong, unstandardized regression coefficient (B) = $-6.74, t = -3.23, p = .004$, whereas the slope was non-significant when emotional eating was weak, unstandardized regression coefficient (B) = $1.93, t = 0.57, p = .58$. So the results revealed that more eating disorder symptoms were present in those binge-purging women who reported higher levels of emotional eating and who rarely used cognitively reappraisal to regulate emotions.

Discussion

The purpose of the present study was to examine how emotional eating and cognitive reappraisal are related to level of eating pathology in eating disordered women and to distinguish between restricting and binge-purging type disordered eating (AN and BN). In comparison to restricting women, women with binge-purge type ED reported limited use of cognitively reappraisal and were stronger emotional eaters. More importantly, the combination of these two types of emotion regulation problems was related to more severe eating pathology: Binge-purge women who have a tendency to eat when emotional and are lacking access to cognitive reappraisal, reported higher levels of overall eating pathology. Importantly, this interaction did not exist in non-clinical women, whereas this group reported levels of emotional eating and cognitive reappraisal similar to the binge-purging group. This interaction also did not exist in the restricting group, who showed much lower levels of emotional eating and higher levels of cognitive reappraisal in the first place.

These findings extend the findings of Aldao *et al.* (2010) who reported only a small association between lack of cognitive reappraisal and eating pathology and argued that the use of maladaptive strategies might play a more important role in psychopathology than the non-use of adaptive strategies. They argued that individuals with ED use their eating behaviour to regulate emotions (instead of

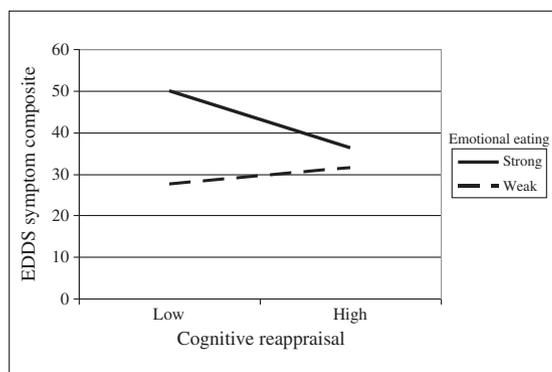


Figure 1. Decomposition of two-way interaction for the *binge-purging* group: overall level of eating pathology as a function of cognitive reappraisal and emotional eating. A higher score indicates stronger eating pathology

using other, more effective regulation strategies), which suggests that they are emotional eaters. Our study confirms the applicability of this theory for binge-purgers, however, not for restricting type ED. This does not mean that restricting type individuals are functional in the way they regulate their emotions. Studies showed that restricting individuals are inclined to use maladaptive emotion regulation strategies (e.g. Harrison, Sullivan, Tchanturia, & Treasure, 2009). Knowing that cognitive reappraisal is a prototypical adaptive emotion regulation strategy that has been related to all sorts of positive health outcomes (Aldao *et al.*, 2010; Gross & John, 2003), one could argue that binge-purge women do not have access to healthy emotion regulation strategies and thus regulate their emotions in a dysfunctional manner that may have an effect on the eating disorder. However, because we only examined the use of cognitive reappraisal, this idea is speculative.

Eating behaviour can be affected by emotions in different ways. When feeling negative, some individuals seem to lose their appetite, whereas others have a tendency to start eating (Corstorphine, 2006; Stice *et al.*, 2002). Level of depression (a mood-related state) was strongly related to symptoms of eating pathology in all groups, and it was thus not specifically related to binge-purging behaviour. Both the non-clinical and the binge-purge individuals scored high on emotional eating, but an important difference between these groups was the level of depression. This may be a reason why the non-clinical individuals do not engage in excessive eating but in different, non-disturbed type of eating behaviour (e.g. eating one chocolate bar). Within the restricting group, depressive symptoms were associated with limited use of cognitive reappraisal and marginally ($p = .06$) with lower emotional eating scores. So it seems that those restricting women with the highest need of emotion regulation were actually lacking access to adaptive strategies that could reduce their negative state. It is further possible that the urge to eat declined in more severely depressed restricting women and so represents a form of emotional *non*-eating.

This thus provides evidence that emotion and mood issues are related to lack of adaptive emotion regulation in all types of disordered eating. Future studies on emotional experience and regulation ought to avoid generalization of all individuals with AN and instead may want to focus on the typical behaviours of these individuals (e.g. restriction, binging). A fruitful next step is to gain more insight in the influence of these emotional problems on daily functioning of eating disordered individuals and to test whether strong emotional eating tendencies or other emotional problems (e.g. depression) in individuals who are lacking adaptive regulation skills have more difficulties recovering for the disorder (in terms of time, symptoms severity or higher relapse rate).

Individuals with binge-purging behaviour often also display other impulsive behaviours, such as stealing, substance abuse and self-injury, and these behaviours are also thought to result from maladaptive coping responses (Nagata, Matsuyama, Kiriike, Iketani, & Oshima, 2000; Waxman, 2009). It is therefore important that therapy not only attends to how emotion regulation problems influence eating behaviour but also relate to other problems that hamper daily functioning. It may be sensible to first test whether ED individuals suffer from emotion regulation issues before starting therapy. Within treatment context, it may be useful for clinicians to explore the particular emotion regulation styles through a combination of emotion regulation measurements (e.g. ERQ) and more

in-depth interviews (e.g. the Emotion Regulation Interview of Werner, Goldin, Ball, Heimberg, & Gross, 2011). When a patient is thought to benefit from therapy that includes an emotion regulation module, we recommend that this therapy will include both dysfunctional strategies, like suppression and emotional eating, and lack of functional strategies, such as cognitive reappraisal.

Overall, results of the current study suggest that a subgroup of ED individuals may benefit from therapy targeting (among other things) emotion regulation problems. Indeed, it has been argued elsewhere that issues regarding feelings and emotions need more attention and potentially need to be addressed prior to a focus on the unrealistic thoughts (Vanderlinden, 2008). The treatment of choice for ED patients, in particular for patients with binge/purge problems, is Cognitive Behavioural Therapy (CBT) that is directed at unrealistic thoughts about body, food and weight individuals may have (Fairburn, 2008). Recently, an enhanced version of this therapy also incorporates mood intolerance, CBT-E (Fairburn *et al.*, 2009).

However, there is a CBT like therapy that specifically aims at emotion regulation difficulties, Cognitive Emotional Behavioural Therapy (CEBT; see also Corstorphine, 2006). The aim of CEBT is to enable ED patients to better comprehend both the expression and experience of emotions in order to be able to successfully recognize and subsequently begin to challenge these emotions. This therapy is meant for patients with high emotional vulnerability and an inability to regulate their emotions by focusing on emotion distress and subsequent associated impulsive behaviours. However, not much is known about the effectiveness of this therapy, and more studies should be conducted on this subject and should examine how CEBT can potentially be helpful for ED.

There are some limitations to this study worth mentioning. This study was conducted using self-report questionnaires, and we therefore had to rely on self-evaluations of the participants. BMI for example was based on self-reported weight and height, and these may be biased. We also relied on self reports to assess emotional eating, which may have resulted in testing beliefs about emotional eating rather than actual eating behaviour in an emotional state. This may explain why non-clinical women had relatively high emotional eating scores (see van Strien, 2005). On the other hand, individuals with BN have been found able to recognize themselves as emotional eaters (Vervaeke *et al.*, 2004). Additional research is nevertheless required to shed more light on this intriguing matter. Other limitations were our small sample size and the fact that we were unable to control for anxious symptoms and medication status (specifically antidepressants). Because we only considered cognitive reappraisal in this study, we were unable to conclude that our participants lacked other adaptive regulation strategies. A final limitation is that we did not collect information regarding length of illness, medication use or type of treatment, and these may be of influence on the present findings. Future studies may want to consider these factors.

To conclude, we revealed that the combination of emotional eating and lack of adaptive emotion regulation is related to eating pathology severity in women who are suffering from binge eating and purging behaviours. These individuals are often troubled by severe emotional problems, and they do not seem able to deal with these issues effectively. This has a negative affect on the disorder. Individuals with these characteristics may benefit from a therapy that specifically focuses on their emotional problems and that teaches them adaptive emotion regulation skills.

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