



## Specific emotion regulation impairments in major depression and anorexia nervosa

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### ARTICLE INFO

#### Article history:

Received 6 April 2012  
Received in revised form  
25 June 2012  
Accepted 12 July 2012

#### Keywords:

Depression  
Anorexia nervosa  
Eating disorders  
Emotion regulation

### ABSTRACT

Emotion regulation (ER) difficulties have been considered to play an important role in the development and maintenance of various mental disorders such as depression and anorexia nervosa. However, previous research has failed to provide detailed insight into the disorder-specificity of ER difficulties. Therefore, the present study investigated specific ER difficulties in female samples of patients with major depression, patients with anorexia nervosa, and healthy controls (total sample:  $N=140$ ). As compared to healthy controls, both clinical groups reported greater ER difficulties concerning both the experience and the differentiation as well as the attenuation and the modulation of emotions. Patients in both clinical groups reported comparably elevated ER difficulties regarding the experience and differentiation of emotions. However, depressed patients reported stronger ER difficulties regarding the attenuation and modulation of emotions as compared to patients with anorexia nervosa. These findings support the notion of ER difficulties as transdiagnostic phenomena, and suggest that depression may be characterized by broader and greater ER difficulties than anorexia nervosa.

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### 1. Introduction

Adaptive emotion regulation (ER) has been proposed to involve a range of cognitive and behavioral processes concerning the experience and differentiation as well as the attenuation and modulation of emotions (Gross and Muñoz, 1995; Gratz and Roemer, 2004; Gratz and Tull, 2010). Recent etiological models of mood and of eating disorders have attached great importance to deficits in ER (Gross and Muñoz, 1995; Taylor et al., 1997; Campbell-Sills and Barlow, 2007; Kring and Sloan, 2010; Haynos and Fruzzetti, 2011), supporting the notion that ER deficits may be regarded as transdiagnostic factors (Gross and Muñoz, 1995; Taylor et al., 1997; Campbell-Sills and Barlow, 2007; Kring and Sloan, 2010). In line with these theoretical models, previous empirical research observed impaired ER in depression (Liverant et al., 2008; Pfeiffer et al., 2011; Brockmeyer et al., in press) as well as in eating disorders such as anorexia nervosa (Gilboa-Schechtman et al., 2006; Harrison et al., 2009; Brockmeyer et al., 2011). Common symptoms of both disorders have been considered to serve an ER function. For example, rumination can be considered

a rather abstract and verbal style of information processing which may thereby protect the depressed individual from aversive imagery and associated physiological arousal (Watkins and Moulds, 2007). In anorexia nervosa, restrictive eating, weight loss, and excessive exercising have been considered to provide an escape from aversive emotional arousal (Haynos and Fruzzetti, 2011).

However, the question whether certain ER difficulties are more strongly associated with certain mental disorders than with others has barely been addressed directly in empirical research. In their recent meta-analysis, Aldao et al. (2010) have delineated the relationships between various ER strategies and specific mental disorders. Their results indicated that dysfunctional ER strategies (e.g., avoidance, suppression, rumination) were generally more closely associated with depression and anxiety disorders than with eating and substance use disorders. However, this meta-analysis was primarily based on studies that (i) used only samples with symptoms of one specific disorder each, (ii) have not controlled for the potential influence of comorbid disorders, and that (iii) have investigated different ER strategies with heterogeneous instruments. In consequence, the meta-analysis did not allow concluding stringently whether specific mental disorders were differentially associated with ER deficits. To overcome these shortcomings, Aldao and Nolen-Hoeksema (2010) tested various ER strategies simultaneously in subject samples suffering from symptoms of different mental disorders. In their study, they found that maladaptive

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strategies (i.e., rumination, suppression) were associated more strongly with symptoms of depression, anxiety, and eating disorders than adaptive strategies (i.e., reappraisal, problem-solving). However, this study used a student sample rather than a clinical sample. Furthermore, the authors investigated some variables (e.g., rumination, problem-solving) that can best be considered antecedents of and responses to emotions (Gross, 1999; Gross and John, 2003) rather than being inherent components of the ER process itself in the sense of experiencing, differentiating, attenuating, and modulating emotions (Gratz and Roemer, 2004).

In studies that compared women suffering from clinical eating disorders and female healthy controls, initially observed differences regarding ER deficits disappeared when levels of depression and anxiety were statistically controlled for (Eizaguirre et al., 2004; Gilboa-Schechtman et al., 2006). Only a few studies have compared clinical samples of patients with eating disorders and patients with mood and/or anxiety disorders so far. These previous studies failed to find any difference between these groups regarding ER deficits (Brockmeyer et al., 2011; Svaldi et al., in press). However, these studies were based on rather small sample sizes and thus may have been underpowered. For example, Svaldi et al. (in press) compared, amongst others, 20 patients with anorexia nervosa, 16 patients with major depressive disorder, and 42 healthy controls. The authors concluded that their findings are in line with the notion of ER deficits as transdiagnostic risk and/or maintaining factors that do not appear to be disorder-specific. Yet, they called for replications with larger samples of patients.

To overcome some of the limitations of previous studies, the present study compared larger samples of patients suffering from either a major depressive disorder or an eating disorder (anorexia nervosa) regarding central ER difficulties. Based on theoretical assumptions of ER deficits as transdiagnostic phenomena (Taylor et al., 1997; Campbell-Sills and Barlow, 2007; Kring and Sloan, 2010) and in line with previous studies that separately demonstrated impaired ER in both disorders (Brockmeyer et al., 2011, 2011b; Gilboa-Schechtman et al., 2006; Liverant et al., 2008; Harrison et al., 2009; Pfeiffer et al., 2011) it was expected that the two patient groups will show greater ER difficulties than healthy controls, but that they will not differ from each other concerning the extent of ER difficulties.

## 2. Methods

### 2.1. Participants

The sample consisted of 41 women with a major depressive disorder (MDD), 39 women with anorexia nervosa (AN), and 60 female healthy controls (HC). Patients were recruited consecutively from a university-based outpatient center serving the community (MDD, 44%; AN, 41%) as well as from an inpatient unit of a university hospital. HC were recruited via advertisements in the media and from the university campus. All participants were Caucasian and between 18 and 65 years of age. Exclusion criteria for the HC group were any diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994). Exclusion criteria for both clinical groups were a current diagnosis of any substance use disorder, and a lifetime diagnosis of a manic episode or psychosis. Borderline personality disorder was chosen as another exclusion criterion due to the special role ER difficulties play in this disorder (Lieb et al., 2004). Further exclusion criteria for the MDD group were any comorbid eating disorder. Conversely, patients with anorexia nervosa were carefully assessed for a current mood disorder, as only patients without comorbid mood disorders were included in the study. In the AN group, 32 patients had restricting subtype and seven patients had binge/purge subtype anorexia nervosa. Due to the small number of AN from the binge/purging subtype, the two groups were not differentiated in the present study. This seems all the more justifiable since in a previous study no differences were found between AN and women with bulimia nervosa regarding ER difficulties (Harrison et al., 2010). Twenty-three percent of the patients were taking psychotropic medication (MDD, 29%, AN, 15%). Written informed consent

was obtained from all participants. The study had been approved by the ethics committee of the university.

### 2.2. Material

In order to assess current and past episodes of mental disorders, the *Structured Clinical Interview for DSM-IV Axis I and II* (SCID; German version: Wittchen et al., 1997) was conducted by the first author and eight clinicians who were all specifically trained for SCID administration and had more than 3 years of experience using the SCID. The SCID has demonstrated good reliability in previous studies (Williams et al., 1992). The *Difficulties in Emotion Regulation Scale* (Gratz and Roemer, 2004) was used to assess specific ER difficulties. The DERS is a 36-item self-report scale that allows capturing a broad array of essential deficits in emotional processing. Participants are asked to rate their ER difficulties on a five-point Likert scale. The DERS has six discrete but interconnected subscales: (1) non-acceptance of emotional responses: this subscale assesses a tendency to have negative secondary emotional responses to one's own negative emotions. (2) Difficulties in engaging in goal-directed behavior: items of this subscale reflect difficulties concentrating and accomplishing tasks when experiencing negative emotions. (3) Impulse control difficulties: this subscale taps difficulties with remaining in control of behavior when experiencing negative emotions. (4) Lack of emotional awareness: this subscale is composed of items reflecting difficulties associated with attending to and acknowledging one's emotions. (5) Limited access to effective ER strategies: this subscale focuses on beliefs that, once upset, little can be done to regulate one's emotions. (6) Lack of emotion clarity: this subscale taps how much individuals know and understand the emotions they are experiencing. Reliability and validity of the original English as well as the German version of the DERS have been demonstrated in previous studies (Gratz and Roemer, 2004; Ehring et al., 2010; Gratz and Tull, 2010). Cronbach's  $\alpha$  values in the present study were in the range of 0.80 and 0.96 for the DERS subscales.

## 3. Results

### 3.1. Sample characteristics

The mean body mass index was 14.91 (S.D.=1.74) for AN, 21.25 (S.D.=1.61) for MDD, and 21.59 (S.D.=1.75) for HC. In the MDD group 17.9% had a severe depressive episode, 76.9% had a moderate depressive episode, and 5.1% had a mild depressive episode. Participants in the MDD group had a mean age of 35 years (S.D.=13 years). The mean age of participants in the AN group was 25 years (S.D.=7 years). In the HC group, participants had a mean age of 34 years (S.D.=14 years). The groups differed significantly from each other regarding age,  $F(2, 137)=9.25$ ,  $p<0.001$ . To account for this potential confound, age was used as a covariate in further analyses.

### 3.2. Group differences regarding ER difficulties

A multivariate analysis of covariance (MANCOVA) was conducted with subject group as independent variable and the subscales of the DERS as dependent variables. MANCOVA results indicated significant differences between the groups, Pillai's trace=0.61,  $F(12, 264)=9.74$ ,  $p<0.001$ . Subsequent ANCOVAs with subject group as the independent variable and the single DERS subscales as the dependent variable revealed significant group differences in terms of all DERS subscales. Results are summarized in Table 1. Post-hoc comparisons with Bonferroni corrections revealed that MDD reported greater ER difficulties than HC across all subscales of the DERS with large effect sizes (Non-acceptance,  $d=1.34$ ; Awareness,  $d=1.01$ ; Clarity,  $d=1.42$ ; Goal-directed behavior,  $d=1.74$ ; Impulse control,  $d=1.42$ ; Access to ER strategies,  $d=2.28$ ). Similarly, AN reported greater ER difficulties than HC in all but one subscale of the DERS (Goal-directed behavior,  $d=0.55$ ) likewise with large effect sizes (Non-acceptance,  $d=0.83$ ; Awareness,  $d=0.97$ ; Clarity,  $d=1.15$ ; Impulse control,  $d=0.95$ ; Access to ER strategies,  $d=1.55$ ). MDD and AN did not differ regarding those subscales of the DERS that primarily capture the experience and differentiation of emotions (Non-acceptance,  $d=0.32$ ; Awareness,  $d=0.12$ ; Clarity,  $d=0.12$ ).

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