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<ATL> Emotion regulation difficulties in obsessive-compulsive disorder </ATL>

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Abstract

Objective Emotion regulation difficulties are implicated in psychological disorders but their role in obsessive-compulsive disorder (OCD) is unclear. Two studies examining these difficulties in OCD are presented.

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Method A community sample (Study 1; $n = 306$) and a clinical OCD sample (Study 2; $n = 59$) completed the Difficulties in Emotion Regulation Scale (DERS) and measures of depression, anxiety, and OCD. In Study 2, the OCD sample was compared to a matched control group ($n = 59$, selected from Study 1).

Results In Study 1, OCD was positively correlated with DERS total and subscale scores, and the DERS significantly predicted OCD severity even after accounting for age, gender, depression, and anxiety. In Study 2, emotion regulation difficulties were significantly higher in the clinical sample compared to the matched control group, even after accounting for depression and anxiety.

Conclusion Results showed that emotion regulation difficulties in OCD cannot simply be attributed to mood difficulties. Theoretical and treatment implications are discussed.

<H1> KEYWORDS

difficulties in emotion regulation, emotion dysregulation, obsessive-compulsive disorder, OCD

<P> Obsessive-compulsive disorder (OCD) is characterized by recurrent and persistent ideas, thoughts, images, or impulses that are intrusive and unwanted and that cause marked anxiety or distress. In response to these obsessions, people with OCD often engage in repetitive ritualistic behaviors or mental acts that are excessive, time-consuming, and often distressing (American Psychiatric Association, 2013). Individuals with OCD consider the intrusive thoughts to be repulsive and unwanted, but individuals without OCD also commonly experience such thoughts (Bouvard, Fournet, Denis, Sixdenier, & Clark, 2016; Moulding et al., 2014). According to cognitive models of OCD, the thoughts in and of themselves are not abnormal. Instead, it is the appraisals of these intrusive thoughts by people with OCD that both bring high levels of distress and trigger attempts at thought

suppression and ritualistic behaviors (Obsessive Compulsive Cognitions Working Group [OCCWG], 2003; Salkovskis, 1985).

<P> In addition to cognitive appraisals, cognitive models also posit that mood and emotions contribute to OCD. Emotions are the affective states that arise when an individual perceives and appraises a specific trigger or situation as important (Oatley & Johnson-Laird, 2014). Mood states, which are more stable and longer in duration, precede and persist beyond an emotionally salient situation and can moderate the way a situation is appraised. Negative mood states are likely to increase negative appraisals, which lead to negative emotions and the use of counterproductive safety-seeking behavior in OCD. Salkovskis (1985) noted that the “presence or absence of dysphoric mood or salient belief appears to be an important determinant of whether discomfort follows ... intrusions or not” (p. 575).

<P> Likewise, Purdon (2004) suggested that low mood primes negative appraisals and thus affects the extent to which thought suppression retriggers intrusions (cf. Clark & Purdon, 2016; Salkovskis & Millar, 2016). Not surprisingly, depression and anxiety are associated with OCD (Rees et al., 2014; Stein et al., 2010), and, consistent with the cognitive model, depression among OCD sufferers is associated with misinterpretations of obsessional thoughts (Abramowitz, Storch, Keeley, & Cordell, 2007; Yap, Mogan, & Kyrios, 2012).

<P> Because emotions and mood affect OCD symptoms, it follows that the ability to regulate one's emotions might affect OCD severity and its maintenance. According to Gratz and Roemer (2004), difficulties in emotion regulation involve a range of deficits as follows: lack of understanding and awareness of emotions; difficulties in accepting negative emotional experiences; when experiencing negative emotions, an inability to control impulses; problems achieving desired goals; and an inability to flexibly use appropriate emotion regulation strategies. Although the cognitive model does not directly refer to these emotion regulation difficulties, emotion regulation theories and mindfulness and acceptance-based therapies do highlight that emotion regulation problems and the avoidance of

unwanted emotional experience in particular play a central role in psychological disorders (Allen & Barlow, 2009; Blackledge & Hayes, 2001; Cristea, Montgomery, Szamoskozi, & David, 2013; Sheppes, Suri, & Gross, 2015; Twohig et al., 2010).

<P> Consistent with these models, emotion regulation deficits have been found in a range of psychological disorders (Berking & Wupperman, 2012; Neacsu, Herr, Fang, Rodriguez, & Rosenthal, 2015) and growing evidence indicates that difficulties in emotion regulation also occur in OCD. In a systematic review, Robinson and Freeston (2014) found evidence that alexithymia (the inability to identify and describe emotions), anxiety sensitivity (the fear of anxiety sensations), and distress intolerance (the inability to tolerate negative emotions) were elevated in OCD, although there was insufficient evidence to support a specific relationship between these constructs and OCD as opposed to other anxiety disorders.

<P> Recently, Stern, Nota, Heimberg, Holaway, and Coles (2014) found that aspects of emotion regulation difficulties (including poorer understanding of and a greater fear of emotions) were associated with higher levels of obsessive-compulsive symptoms in a nonclinical sample. Likewise, Fergus and Bardeen (2014) found that OCD symptom severity in a community sample was associated with a wide range of emotion regulation difficulties as measured by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) and the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). When all DERS and ERQ subscales were entered into a regression model and controlled for negative affect, the emotional suppression, impulse control difficulties, lack of emotional awareness, and emotional clarity scales made significant unique contributions to the prediction of OCD symptoms. Fergus and Bardeen recommended further research into the association between facets of emotion regulation and OCD symptoms because this would inform the targeting of specific emotion regulation facets in psychological interventions.

<P> Consistent with the above-mentioned studies with nonclinical samples, emotion regulation difficulties have also been noted in clinical OCD samples. In their study of

individuals with OCD who had concerns about harm and unacceptable thoughts, Smith, Wetterneck, Hart, Short, and Björgvinsson (2012) found that perceiving emotions as highly threatening and having a fear of not-just-right feelings were unique predictors of OCD with symmetry concerns. However, they did not control for depression or anxiety severity.

<P> In a study investigating emotion regulation difficulties in hoarding disorder and OCD, de la Cruz et al. (2013) found that individuals with hoarding disorder, OCD, or both had significantly higher scores than the control group on all DERS subscales, except for emotional awareness. There were no differences in emotion regulation difficulties between hoarding disorder and OCD, but emotion regulation difficulties were correlated with OCD rather than hoarding severity. They did not examine the associations between OCD severity and specific emotion regulation difficulties, and they did not control for depression or anxiety.

<P> Between 60% and 80% of individuals with OCD have experienced at least one major depressive episode (MDE), and the lifetime comorbidity between OCD and generalized anxiety disorder (GAD) is 30% (Pallanti, Grassi, Sarrecchia, Cantisani, & Pellegrini, 2011). These figures are substantially higher than the lifetime prevalence of MDE (28.2%) and GAD (3.7%) in the general population (Veneleur et al., 2017; Ruscio et al., 2017). Because anxiety and mood disorders are associated with emotion regulation difficulties, it would be important to clarify if emotion regulation difficulties occur specifically in OCD or are simply a result of higher levels of depression and anxiety.

<P> Preliminary evidence shows that improving emotion regulation skills can enhance psychological treatments for OCD. Allen and Barlow (2009) taught seven patients with OCD how to reduce emotional avoidance to clinically irrelevant cues, leading to decreased thought suppression, increased acceptance of thoughts and feelings, and decreased OCD severity. As non-OCD cues were used, the decrease in OCD severity could not be attributed to exposure effects per se. Likewise, in a randomized clinical trial, Twohig et al. (2010) found that acceptance and commitment therapy (ACT) was more effective than progressive muscle relaxation in reducing OCD severity, indicating that improving aspects of

emotion regulation such as the ability to choose actions consistent with one's values while accepting the experience of difficult emotions can lead to improvements in OCD without in-session exposure.

<P> In summary, it appears that OCD is characterized by a range of emotion regulation difficulties, particularly a fear of or nonacceptance of emotions, a lack of emotional clarity, and impulse control difficulties. However, as noted by Fergus and Bardeen (2014), an important question that requires further evaluation is whether these difficulties in emotion regulation are specific to OCD. Because depression and anxiety symptoms are common in OCD (Pallanti et al., 2011) and emotion regulation difficulties are associated with depression and anxiety (Aldao, Nolen-Hoeksema, & Schweizer, 2010), it is important to examine whether the associations between emotion regulation difficulties and OCD are independent of depression and anxiety severity.

<P> This study presents two studies examining the relationships between emotion regulation difficulties and OCD in a community sample and a treatment-seeking clinical sample. We hypothesized that

- <BL> OCD severity would be correlated with all the DERS subscales: non-acceptance of emotional responses (DERS-Nonaccept), difficulties engaging in goal-directed behavior when distressed (DERS-Goals), impulse control difficulties (DERS-Impulse), the lack of emotional awareness (DERS-Aware), limited access to effective emotion regulation strategies (DERS-Strategies), and the lack of emotional clarity (DERS-Clarity) in both samples.
- Nonacceptance, impulse control difficulties, and emotional clarity would have unique associations with OCD severity in both nonclinical and clinical samples, even after accounting for depression and anxiety.
- OCD patients would have significantly higher scores on all DERS subscales after accounting for depression and anxiety, when compared to age and gender matched nonclinical controls.

<P> Two studies are presented in the following sections. Study 1 involved a general community sample and is a partial replication of Fergus and Bardeen (2014). In Study 2, we compared emotion regulation difficulties between a sample of patients with OCD and a matched control group drawn from Study 1.

<H1> **STUDY 1--METHOD**

<H2> **Participants**

<P> Participants were 331 individuals from the general community who volunteered to complete a series of online self-report questionnaires. This was a convenience and snowball sample with participants recruited through advertisements on noticeboards in the university and surrounding community and postings on social media. Less than 10% did not complete the questionnaire, resulting in a final sample of 306 participants. Ages ranged from 19 to 78 years (mean [*M*] = 32.78, standard deviation [*SD*] = 12.16). There were 220 females (72.5%) and 86 males (27.5%).

<H2> **Materials**

<P> The following self-report measures were administered online via Qualtrics. All measures demonstrated good or excellent internal consistency in the current sample, with Cronbach's alphas ranging from .80 to .93 (see Table 1).

<H3> **Depression Anxiety and Stress Scales – 21 item version (DASS-21; Lovibond & Lovibond, 1995)**

<P> The DASS-21 is a brief measure of psychological distress and comprises three subscales measuring depression, anxiety, and stress. While the whole scale was administered, only the anxiety and depression subscales were used in this study. Both scales comprise seven items each. Participants rated the extent to which the item applied to them over the last week on a 4-point Likert scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The total scores for each scale are

calculated by summing scores on the seven items and multiplying the total by two. The DASS-21 has very good psychometric properties (Henry & Crawford, 2005)

<H3> **DERS (Gratz & Roemer, 2004)**

<P> The DERS comprises 36 items and is designed to measure difficulties in emotion regulation across six subdomains. Participants are asked to rate their agreement with the statements on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). Higher scores indicated greater difficulties in regulating emotions. In addition to subscale scores, the revised DERS total scale score was used (DERS-R; Bardeen, Fergus, & Orcutt, 2012) instead of the sum of all items. The DERS-R was calculated by summing 30 items in the scale, leaving out six items corresponding to the lack of awareness in emotional responses (DERS-Aware).

<P> In examining the latent factor structure of the DERS, Bardeen et al. (2012) found that the items of the DERS-Aware subscale did not load onto the same higher-order emotion regulation construct as the other five DERS subscales. They therefore suggested that the DERS-Aware subscale should be excluded when calculating the total score on the DERS. Our decision to use the DERS-R is consistent with our findings regarding the pattern of associations of the DERS-Aware scale, including nonsignificant associations with some of the other DERS subscales and weak associations with OCD severity (see Table 2).

<H3> **Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010)**

<P> The DOCS is a 20-item self-report measure of OCD severity measured across four OCD symptom dimensions: (a) Contamination, (b) Responsibility for Harm and Mistakes, (c) Unacceptable Thoughts, and (d) Symmetry/Order. Within each subscale, five items (rated 0-4 on a 5-point Likert scale) assessed the following parameters of severity over the past month: (a) time occupied by obsessions and rituals, (b) avoidance behavior, (c) associated distress, (d) functional interference, and (e) difficulty disregarding the obsessions and refraining from the compulsions. The total score of all four subscales was used to measure OCD severity. The DOCS is a valid and reliable assessment of OCD symptom dimension

severity across both nonclinical and clinical populations (Abramowitz et al., 2010).

<H2> Procedure

<P> The study was approved by the university human research ethics committee.

Advertisements and social media posts for recruitment of participants included an online link that directed participants to complete the online self-report measures. At the conclusion of the survey, participants were invited to enter a draw to win one of four \$100 book vouchers.

<H2> Data analysis

<P> All statistical analyses were performed using SPSS (version 22). Pearson's correlations and multiple regression analyses were used to ascertain the relationship between the variables and assess the influence of the independent variables on OCD severity.

<H1> STUDY 1--RESULTS

<H2> Preliminary analyses

<P> Descriptive statistics are presented in Table 1. The mean score on the DOCS total was below the recommended cutoff of 18 (Abramowitz et al., 2010) and the mean scores on the DASS depression and anxiety scores were below the cutoff scores of 10 and 8, respectively (Lovibond & Lovibond, 1995), indicative of a nonclinical sample. All scales were positively skewed except the DERS-Aware and DERS-Goals subscales, which were normally distributed. Square root transformations were conducted; however, given there was no difference between transformed and untransformed data, results using untransformed data are presented.

<P> Age was significantly and negatively correlated with all variables except DERS aware. A number of independent *t*-tests (equal variances not assumed) were also carried out to investigate whether gender had any influence on the variables of interest (see Table 1). Females had significantly higher DERS-R total scores, $t(155.2) = -2.96, p = .004$, DERS-Impulse scores, $t(169.5) = -4.04, p < .001$, and DERS-Strategies scores, $t(168.4) = -3.26, p < .001$. Females also had significantly higher DOCS-Responsibility scores than males, $t(181.4) = -3.11, p = .002$, and significantly higher DASS depression scores, $t(178.6) = -2.09,$

$p = .03$. Because of these effects, age and gender were included as covariates in the multiple regression analyses.

<H2> **Correlations**

<P> Zero-order correlations among variables are presented in Table 2. There was a strong positive correlation between the DOCS-total and DERS-R total scores. There were moderate positive correlations between the DOCS-total and all DERS subscales, except a weak significant correlation with DERS-Aware. In general, there was a similar pattern of correlations between the DOCS subscales and DERS subscales, with DOCS-Unacceptable Thoughts generally having a higher correlation (average across subscales, $r = .34$), followed by DOCS-Responsibility (average $r = .30$), DOCS-Symmetry (average $r = .25$), and DOCS-Contamination (average $r = .21$). There were also moderate to strong positive correlations between DOCS scores and both depression and anxiety severity as measured by the DASS-21.

<H2> **Multiple regression analyses**

<P> Multiple regression analyses were conducted controlling for age and gender in addition to DASS-anxiety and DASS-depression. Mahalanobis distances were also computed and multivariate outliers were identified with the employment of the $p < .001$ criterion. Multivariate outliers were primarily due to individuals who reached the clinical threshold for OCD or had high DERS-R scores. All outliers were therefore kept in the analyses to ensure a thorough representation of the population. Age, gender, DASS-depression, and DASS-anxiety were entered in the first step of the hierarchical multiple regression. DERS subscales were entered in the second step. Separate analyses were conducted with DOCS-total, and each of the DOCS-subscales (Contamination, Responsibility, Unacceptable Thoughts, and Symmetry) as dependent variables.

<P> The results from step 2 of the hierarchical multiple regression analyses are presented in Table 3. After accounting for age, gender, depression, and anxiety, the DERS subscales made a significant unique variance to the prediction of DOCS-total scores, DOCS-

Responsibility, DOCS-Unacceptable Thoughts, and DOCS-Symmetry. However, DERS-subcales did not make a significant contribution to DOCS-Contamination scores after accounting for age, gender, DASS-depression, and DASS-anxiety. A similar pattern emerged for the significant predictors across the different OCD dimensions, with DERS-Nonaccept making the strongest unique contribution followed by DERS-Goals. These two DERS subcales made significant unique contributions to the prediction of DOCS-total, DOCS-Responsibility, and DOCS-Symmetry. While the overall scales contributed to prediction, no individual predictor was significant for DOCS-Unacceptable Thoughts.

<P> The results of Study 1 are consistent with previous research indicating an association between OCD and emotion regulation difficulties. However, as Study 1 involved primarily nonclinical participants, generalizing the findings to a clinical population requires the examination of emotion regulation difficulties in a clinical OCD sample. To address this limitation, Study 2 was conducted and involved a sample of treatment seeking OCD patients. Their scores on the DERS were compared with a matched control group drawn from Study 1 participants.

<H1> **STUDY 2--METHOD**

<H2> **Participants**

<P> Clinical participants (N = 59) in Study 2 had attended either an intensive inpatient or outpatient OCD treatment program. Their de-identified archival data were used for this study. There were 26 males and 33 females. The age range was between 19 and 63 years ($M = 32.88$ years, $SD = 10.45$). Fifty-nine participants from Study 1 were selected on the basis of age and gender to form a matched nonclinical control group. Scores on the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989; Steketee, Frost, & Bogart, 1996) for the clinical group ranged from 11 to 35, with a mean score of 25.29 (standard deviation [SD] = 5.42), which was in the severe range. There were 26 males and 33 females in the control group with an age range between 19 and 63 years ($M = 32.81$ years, $SD = 10.34$). The DOCS-total score for the control group ranged from 0 to 15 (less than the

recommended cutoff of 18), with a mean of 3.75 ($SD = 3.91$).

<H2> **Materials and procedure**

<P> As part of the assessment process in the OCD programs, consultant psychiatrists made diagnoses and participants completed a number of self-report questionnaires prior to commencement of treatment. The self-report questionnaires were for program evaluation and participants gave consent for their de-identified data to be used for research purposes. Ethics clearance was obtained to use the archival data. Measures relevant to the current study were the DERS, DASS-anxiety, and DASS-depression, which have been described in Study 1. To measure OCD severity, the self-report version of the Y-BOCS (Steketee, Frost, & Bogart, 1996) was used. The 10-item severity scale has very good psychometric properties and is widely used in clinical and research settings. Items are rated on a 5-point scale ranging from 0 (*virtually no symptoms present*) to 4 (*indicating extreme symptoms*). Internal consistency of these measures are presented in Table 4.

<H2> **Data analysis**

<P> All statistical analyses were performed using SPSS (version 22). To examine differences between the clinical and control groups, analyses of covariance were conducted with DERS subscale and total scores as dependent variables and DASS-depression and DASS-anxiety as covariates. Correlations were conducted in the clinical group to examine the association between DERS and OCD severity. To examine unique contributors to OCD severity, DERS subscales were entered into a regression model with Y-BOCS as the dependent variable. Similar to Study 1, DASS-depression and DASS-anxiety were entered as covariates.

<H1> **STUDY 2--RESULTS**

<H2> **Preliminary analyses**

<P> Descriptive statistics are presented in Table 4. All participants in the clinical group fulfilled *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition* (2013; American Psychiatric Association) criteria for OCD. Of these participants, 38 participants had comorbid

psychiatric conditions with many having more than one, including personality disorders or traits ($n = 11$), depressive disorders ($n = 28$), anxiety disorders ($n = 15$), hoarding disorder ($n = 2$), bipolar disorder ($n = 2$), autism ($n = 2$), schizoaffective disorder ($n = 1$), and alcohol use disorder ($n = 1$). The data in the clinical group for all variables were normally distributed. In the control group, DERS-R, DERS-Clarity, DERS-Aware, and DERS-Goals were normally distributed, but all other variables were positively skewed. Levene's test also showed that the assumption of homogeneity of variances was not met. To address these issues, all analyses were also conducted using bootstrapping with 5,000 stratified bootstrap samples. Results were unchanged for all analyses and therefore nonbootstrapped results were presented.

<H2> Comparisons with a matched control group

<P> An analysis of covariance was conducted to compare the clinical group with the age and gender matched sample selected from Study 1. DASS-depression and DASS-anxiety were entered as covariates. There were significant differences between the two groups on the DERS-R total, and on the DERS subscales of nonacceptance, goals, impulse control, and strategies, with moderate to large effect sizes (Table 4). As noted in Table 4, there were large and significant differences between the two groups on DASS-depression and DASS-anxiety scores. There were no significant differences between groups on DERS-Aware and DERS-Clarity when depression and anxiety were included as covariates. However, when these covariates were excluded, significant group differences were found for DERS-Aware, $F(1, 116) = 8.66, p = .004, \eta_p^2 = .07$, and DERS-Clarity, $F(1, 116) = 34.36, p < .001, \eta_p^2 = .23$.

<H2> Correlations and multiple regression analyses

<P> Zero-order correlations among variables are presented in Table 5. While some weak correlations were noted between the Y-BOCS and DERS subscale scores, none were statistically significant. To examine if DERS subscales made unique contributions to the prediction of Y-BOCS scores, DASS-depression and DASS-anxiety were entered into the

first step of a hierarchical regression model and the DERS subscales into the second step.

No significant change in variance was found in step 2, $\Delta R^2 = .04$, $\Delta F(6, 50) = 0.40$, $p = .88$.

There were no significant unique associations between any DERS subscale and Y-BOCS.

<H1> **DISCUSSION**

<P> This study presents two studies aimed at expanding our knowledge of emotion regulation in OCD. As predicted, in Study 1, all facets of emotion regulation difficulties in the community sample were positively correlated with OCD severity and two facets (nonacceptance of emotions and difficulties in engaging in goal-directed behavior when distressed) had unique associations with OCD severity after accounting for the potential confounding variables of age, gender, anxiety, and depression. In Study 2, the clinical OCD group—unexpectedly—did not show significant associations between emotion regulation difficulties and OCD severity. However, when compared with a matched control group, the clinical OCD group had significantly more difficulties when distressed regarding accepting their emotions, engaging in goal-directed behavior, and controlling their impulses when upset as well as their efficacy in using emotion regulation strategies, even after accounting for depression and anxiety.

<P> To our knowledge, this is the first paper to examine the full range of difficulties in emotion regulation as defined by Gratz and Roemer (2004) in both a nonclinical community sample and a treatment-seeking clinical OCD sample while accounting for depression and anxiety. Our findings provide evidence of the presence of difficulties in emotion regulation in OCD that are independent of depression and anxiety. The unique contribution of emotion regulation difficulties to OCD severity in the community sample is consistent with the cognitive model of OCD (Salkovskis, 1985), which suggests that mood disturbances and, by extension, emotion regulation difficulties have a negative impact on OCD severity. The findings of both studies are also in line with mindfulness and acceptance-based therapies that suggest a central transdiagnostic role of emotion regulation difficulties in

psychopathology. Our findings are also consistent with previous studies on nonclinical samples that have found positive associations between OCD severity and emotion regulation difficulties and, more specifically, with difficulties in accepting and tolerating negative emotions (Fergus & Bardeen, 2014; Robinson & Freeston, 2014; Stern et al., 2014; Smith et al., 2012).

<P> There were, however, differences between our findings and Fergus and Barden's (2014) study regarding which facets of emotion regulation difficulties showed unique associations with OCD. In our studies, difficulties in both accepting emotions and engaging in goal-directed behavior when distressed stood out as important facets in both clinical and nonclinical samples. Although this finding is consistent with Stern et al. (2014) and Smith et al. (2012), Fergus and Barden reported that nonacceptance of emotions did not make a unique contribution to OCD severity in their nonclinical sample. They did, however, find a moderate and positive zero-order correlation between this facet and OCD. Perhaps the unique contribution was reduced by their inclusion of an expressive suppression measure (not used in our study), which had a unique association with OCD. Items in the expressive suppression subscale (e.g., "When I am feeling negative emotions, I make sure not to express them") do imply that individuals high on expressive suppression do not accept their emotions and this would be consistent with our findings.

<P> The need to reduce negative emotions and accompanying negative appraisals might be a result of a strong desire for control and intolerance of uncertainty in OCD (Carleton, 2016; Moulding, Doron, Kyrios, & Nedeljkovic, 2008; Moulding, Kyrios, & Doron, 2007). Thus, the oversensitivity and nonacceptance of emotions would presumably lead to both avoidance of emotionally charged stimuli and enacting compulsions and reassurance seeking to eliminate the negative emotions. Thus, paradoxically, the fear of emotions and attempts at avoiding unwanted emotions mean that emotional control falls short due to the use of ineffective strategies like reassurance seeking and the elaboration of ever more complex routines and rituals. Future research into how obsessive beliefs interact with

difficulties in emotion regulation to increase OCD avoidance and behaviors is required and would inform how the cognitive model of OCD might be modified.

<P> While there were significant differences in emotion regulation difficulties between the clinical and matched controls, the lack of significant correlations between OCD severity and difficulties in emotion regulation in the clinical sample was unexpected and requires explanation. First, the small sample size in the clinical group meant only large effect sizes could be detected, and so the nonsignificant effects in this study might become significant given a larger clinical sample. A second possibility is that there could be threshold effects--such that a higher level of emotional regulation difficulties is associated with the onset of OCD or its maintenance--but above that level, other mechanisms such as OCD-related cognitions take over in terms of determining severity.

<P> Alternatively, it might be that the functional role of compulsions, reassurance seeking and covert neutralization strategies serve to “muddy the waters” in terms of clinical populations. That is, because compulsions do effectively (albeit only in the short term) manage anxiety, as does preemptive ritualizing to avoid anxiety, then the relationship between emotional regulation and clinical levels of OCD (where compulsions are prominent) might not be as strong in nonclinical samples, in which compulsions might be less likely to be observed or be less effectively or typically used.

Interestingly, consistent with this explanation, the results of Study 2 showed no significant association between anxiety and OCD severity in the clinical sample, even though the OCD clinical sample had significantly higher anxiety than the matched control group. If this explanation is correct, then one might also expect to observe stronger positive relationships between OCD severity and difficulties in emotion regulation in OCD participants who are engaging in exposure and response prevention, whereby they must tolerate the obsessions and emotions without engaging in compulsive behaviors. Conducting laboratory experiments might be a better way to elicit such correlations between symptoms and emotional regulation problems in clinical samples (e.g., distress tolerance tasks such as

tolerance to emotionally eliciting videos; for example, see Timpano, Shaw, Cougle, & Fitch, 2014).

Finally, it should be noted that the presence of significant group differences but the lack of significant associations within the clinical group is consistent with the conceptualization of emotion regulation difficulties as a transdiagnostic construct. Thus, while difficulties in emotion regulation are related to OCD, they may also be influenced by other nonspecific factors including the presence of other comorbid conditions in the clinical sample (Whitehead & Suveg, 2016).

The current findings together with previous research on emotion regulation difficulties in OCD provide justification for clinical trials to examine the effects of emotion regulation interventions for OCD, either on their own or in combination with other validated treatments. Psychological treatments with some focus on improving emotion regulation skills such as ACT (Twohig et al., 2010) and the unified protocol (Farchione et al., 2012) are promising interventions for OCD, and component analyses of these and cognitive-behavioral interventions might reveal what aspects of emotion regulation are important in OCD treatment. Other similar mindfulness-based interventions such as dialectical behavior therapy skills training (Valentine, Bankoff, Poulin, Reidler, & Pantalone, 2015) and mindful self-compassion (Germer & Neff, 2013) could lead to improvements in acceptance and the ability to tolerate difficult emotions, which in turn would increase confidence and competence in regulating emotions in adaptive ways, and lower the OCD sufferers' reliance on maladaptive emotion regulation strategies such as rituals, compulsions, and thought suppression.

Furthermore, improvements in emotion regulation might provide greater cognitive resources that would subsequently allow for greater cognitive flexibility, improved mood, and a decrease in the strength of obsessional beliefs. Importantly, these improvements in emotion regulation might also lead to better response and retention rates in current psychological interventions given the higher-than-optimal level of dropouts from, and

low treatment adherence rates for, current therapeutic regimens (Dowling et al., 2016; Öst, Havnen, Hansen, & Kvale, 2015).

<H2> **Implications for future research**

<P> Our findings also have implications for current models of OCD. Although emotion regulation deficits have been incorporated into models of other disorders such as borderline personality disorder (Salsman & Linehan, 2012), MDD (Aldao et al., 2010) and GAD (Mennin, Fresco, Ritter, & Heimberg, 2015), current cognitive models of OCD have not explicitly implicated the role of emotion regulation. We propose that emotion regulation may play a central role in the OCD maintenance process. Compulsions may be viewed—partially or fully depending on the individual and the context—as emotion regulation strategies performed to reduce the distress associated with intrusions, along with their acknowledged role in the cognitive model of neutralizing responsibility or threat. The inclusion of emotion regulation difficulties (especially the nonacceptance of emotions) into the cognitive model could explain the repetitive nature of compulsions and why OCD sufferers keep repeating a behavior that fails in its primary function of neutralizing responsibility or threat.

<P> Following Sheppes et al.'s (2015) extended process model of emotion regulation (which suggests that different clinical conditions coincide with specific failures in emotion regulation at different stages of the emotion regulation process), we suggest that emotion regulation difficulties such as the nonacceptance of emotions, problems with greater inability at achieving goals when distressed, problems controlling impulses, and limited access to emotion regulation strategies when experiencing negative emotions differentially affect the identification, selection, implementation, and monitoring stages of emotion regulation in OCD.

<P> For example, when an OCD sufferer with contamination concerns comes into contact with a stain on a table, negative threat and responsibility appraisals generate emotions such as disgust, guilt, and anxiety. At the identification stage, a negative valuation of these emotions (i.e., nonacceptance) increases the perception and intensity of these

emotions and their perceived costs. This leads to a higher likelihood of the individual initiating attempts at regulating these emotions. At the selection stage, the nonacceptance of emotions and limited access to strategies further limit the selection of emotion regulation strategies to those of either avoidance or undoing behaviors. At the implementation stage, problems with controlling impulses and difficulties in directing efforts on longer-term goals when under distress contribute to a sense of urgency to eliminate these emotions.

Finally, at the monitoring stage, limited access to strategies further prevents the switching of regulatory strategies when a compulsion is ineffective. The nonacceptance of emotions also contributes to the inability to stop emotion regulation because the ideal desired state of being in control and the complete elimination of one's emotions are difficult to attain. This is further compounded by the continued ineffectiveness of compulsions (which are effortful and ego-depleting) at achieving the desired state.

Limitations

The two studies are not without limitations. First, participants from Study 1 were a convenient sample and were not representative of the general population. There were a higher proportion of women and younger adults. Generalizing findings to men and older adults await future replication. The use of archival data for the clinical sample is another limitation of the study. Although referring psychiatrists made the OCD diagnoses, these were not confirmed by structured clinical interviews. Nonetheless, the sample was recruited from a treatment-seeking population and had a mean Y-BOCS score in the severe range. Future research in clinical samples should be conducted with larger sample sizes using structured clinical interviews for diagnoses and symptom severity. The use of a matched control group in Study 2 that was drawn from Study 1 was not ideal as questions could be raised about the independence of sampling between the two studies. Thus, Study 2 is strictly speaking not a replication of Study 1 because any biases in the Study 1 sample could affect the results of both studies.

The use of self-report measures is a limitation of both studies. While common in studies of emotion regulation, there may be important differences in an individual's perceived ability to tolerate emotion and their actual ability to do so. Finally, although we controlled for depression and anxiety, the study was cross-sectional, and thus causal relationships cannot be established with this type of methodology. It is not clear from our findings whether difficulties in emotion regulation are a cause or a consequence of OCD. It is possible that difficulties in emotion regulation such as the nonacceptance of emotions do not just intensify and maintain OCD, but they are also essential predisposing factors that lead to the development of OCD. On the other hand, emotion regulation difficulties may simply be a consequence of OCD symptoms or the relationships could also be bidirectional. Furthermore, it is also possible that there is an equifinality in etiological pathways such that emotion regulation difficulties do play a causal role for some but not all individuals with OCD (Chicchetti & Rogosch, 1996). These different explanations are speculative and await testing in future experimental and longitudinal studies, including potentially studies using "in-the-moment" ecological momentary assessment methods.

<H2> Conclusion

The cognitive model of OCD not only emphasizes the role of negative appraisals, but it also suggests that OCD is influenced by emotion regulation difficulties. As predicted, the current studies found that OCD was indeed characterized by emotion regulation difficulties and consistently implicated the nonacceptance of emotions and difficulties engaging in goal-directed behavior when distressed. While emotional regulation did not correlate with symptom severity in the OCD group itself, it did clearly differentiate the OCD group and the nonclinical group, over and above mood differences. These findings underscore the important role of emotion regulation in our understanding of OCD, and the potential role it could play in improving treatment, well as improving the tolerability of treatment for individuals with this debilitating disorder.

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{TBL1}<TC>**TABLE 1** Descriptive statistics for the nonclinical community sample

	<TH>Total Sample (<i>N</i> = 306)		Males (<i>n</i> = 86)		Females (<i>n</i> = 220)	
	Cronbach's α	Mean (<i>SD</i>)	Men (<i>SD</i>)		Mean (<i>SD</i>)	
<TB>DOCS-Total	.93	10.35 (9.81)	8.74 (9.71)		10.10 (9.80)	
DOCS-Contamination	.87	2.28 (2.85)	1.93 (2.68)		2.42 (2.91)	
DOCS-Responsibility	.88	2.72 (3.08)	1.92 (2.69)		3.04 (3.17)	
DOCS-Unacceptable thoughts	.91	2.69 (3.32)	2.73 (3.64)		2.67 (3.20)	
DOCS-Symmetry	.91	2.66 (3.24)	2.16 (3.18)		2.85 (3.25)	
DERS-R total	.95	65.70 (19.78)	60.42 (19.53)		67.76 (19.53)	
DERS-Nonaccept	.91	13.32 (5.56)	12.63 (5.70)		13.60 (5.49)	
DERS-Goals	.89	13.96 (4.57)	13.27 (4.72)		14.23 (4.50)	
DERS-Impulse	.88	11.81 (4.61)	10.21 (12.43)		12.43 (4.62)	
DERS-Awareness	.83	14.42 (4.33)	14.77 (4.68)		14.28 (4.19)	
DERS-Strategies	.90	16.36 (6.54)	14.51 (6.04)		17.08 (6.60)	
DERS-Clarity	.80	10.25 (3.20)	9.80 (3.21)		10.43 (3.18)	
DASS-Depression	.90	7.51 (8.35)	6.02 (7.44)		8.09 (8.63)	
DASS-Anxiety	.82	5.86 (6.82)	4.91 (6.63)		6.24 (6.87)	

<TF>Note. SD = standard deviation; DOCS = Dimensional Obsessive-Compulsive Scale; DERS = Difficulties with Emotion Regulation Scale; DASS = Depression Anxiety Stress Scales.

{TBL2}<TC>**TABLE 2** Zero-order correlations among variables (*N* = 306)

<TH>Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. <TB>DOCS-Total	-													
2. DOCS-Contamination	.72	-												
3. DOCS-Responsibility	.82	.48	-											

4.	DOCS- Unacceptable thoughts	.79	.36	.53	-										
5.	DOCS- Symmetry	.82	.46	.55	.54	-									
6.	DERS-R total	.50	.30	.41	.49	.36	-								
7.	DERS- Nonaccept	.43	.27	.37	.39	.33	.79	-							
8.	DERS-Goals	.35	.20	.28	.34	.26	.72	.38	-						
9.	DERS-Impulse	.42	.27	.32	.41	.30	.85	.55	.55	-					
10.	DERS- Awareness	<u>.12</u>	.07	<u>.13</u>	.10	.09	.31	.29	.08	.21	-				
11.	DERS- Strategies	.43	.26	.34	.45	.27	.91	.61	.63	.76	.22	-			
12.	DERS-Clarity	.37	<u>.17</u>	.36	.36	.26	.69	.55	.31	.53	.52	.55	-		
13.	DASS- Depression	.43	.22	.36	.47	.30	.59	.38	.40	.49	.17	.62	.42	-	
14.	DASS-Anxiety	.58	.31	.48	.55	.44	.53	.43	.27	.48	.20	.48	.46	.54	-

<TF>Note. **Bold** *rs* significant at $p < .001$; Underlined *rs* significant at $p < .05$ (two-tailed). DOCS = Dimensional Obsessive Compulsive Scale; DERS = Difficulties in Emotion Regulation Scale; DASS = Depression Anxiety Stress Scales.

{TBL3}<TC>**TABLE 3** Summary of regression results predicting obsessive-compulsive symptoms (N = 306)

<TH>Variable	Dimensional Obsessive Compulsive Scale									
	Total		Contamination		Responsibility		Unacceptable Thoughts		Symmetry	
	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>	<i>B</i>	<i>t</i>
<TB>Step 1										
Age	-.0	-0.14	-.03	-0.59	.03	0.63	-.03	-0.56	.01	0.13
Gender	.0	0.59	.03	0.47	.12	2.34*	-.10	-2.13*	.05	0.97

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	3									
DASS	.1	1.65	.01	0.19	.08	1.19	.15	2.42*	.07	0.94
Depression	0									
DASS	.4	7.11*	.22	3.10*	.35	5.60**	.36	6.20**	.35	5.37**
Anxiety	1	*								
Step 2										
DERS-	.1	2.98*	.14	1.90	.15	2.33*	.09	1.47	.19	2.70*
Nonaccept	8									
DERS-	.1	2.47*	.05	0.76	.13	2.07*	.10	1.69	.17	2.48*
Goals	5									
DERS-	.0	0.28	.07	0.80	-.07	-0.91	.03	0.45	.04	0.43
Impulse	2									
DERS-	-	-1.00	-.00	-0.01	-.04	-0.66	-.09	-1.65	-.03	-0.56
Awareness	.0									
	5									
DERS-	-	-0.82	.01	0.09	-.07	-0.77	.03	0.38	-.19	-1.94
Strategies	.0									
	7									
DERS-	.0	0.69	-.08	-0.99	.13	1.81	.07	0.97	.02	0.25
Clarity	5									
ΔR^2	.05		.03		.03		.04		.04	
$\Delta F(6, 295)$	4.02, $p =$		1.61, $p = .15$		2.85, $p = .01$		3.02, $p = .007$		2.69, $p = .02$	
	.001									

<TF>Note. Only standardized betas in the final step are reported. DOCS = Dimensional Obsessive Compulsive Scale; DERS = Difficulties in Emotion Regulation Scale; DASS = Depression Anxiety Stress Scales.

** $p < .001$. * $p < .05$ (two-tailed).

{TBL4}<TC>**TABLE 4** Descriptive statistics and ANCOVA results with DASS-Depression and DASS-Anxiety as covariates for DERS scores

	<TH>Clinical Sample (<i>n</i> = 59)			Match Control (<i>n</i> = 59)			<i>F</i> (<i>l</i> , <i>l</i> 4)	<i>p</i>	η_p^2
	Mean	<i>SD</i>	Cronbach's α	Mean	<i>SD</i>	Cronbach's α			
<TB>DERS-R Total	92.51	22.61	.94	52.98	12.22	.90	15.83	<.001	.12
DERS-Nonaccept	17.49	5.97	.86	10.21	3.63	.83	6.22	.014	.05
DERS-Goals	19.15	4.46	.87	11.27	3.56	.81	20.72	<.001	.15
DERS-Impulse	17.12	6.00	.85	9.68	3.35	.79	7.57	.007	.06
DERS-Awareness	16.14	5.83	.86	13.40	4.17	.83	1.02	.31	.01
DERS-Strategies	25.59	7.40	.88	12.78	4.16	.81	15.62	<.001	.12
DERS-Clarity	13.15	4.87	.86	8.92	2.67	.77	0.08	.78	.00
DASS-Depression	24.31	11.45	.92	4.34	6.29	.86	137.85	<.001	.54
DASS-Anxiety	16.85	8.34	.75	3.39	3.59	.59	129.66	<.001	.53

<TF>Note. ANCOVA = analysis of covariance; SD = standard deviation; DERS = Difficulties with Emotion Regulation Scale; DASS = Depression Anxiety Stress Scales. Due to inequality of variances, bootstrapping with 5,000 stratified bootstrap samples were conducted. Results were unchanged and therefore nonbootstrapped results are presented.

{TBL5}<TC>**TABLE 5** Zero-order correlations among variables in OCD clinical sample, *N* = 59

<TH>Variable	1	2	3	4	5	6	7	8	9	10
1. <TB>Y-BOCS	-									
2. DERS-R Total	.14	-								
3. DERS-Nonaccept	-.03	.77	-							
4. DERS-Goals	.14	.79	.48	-						
5. DERS-Impulse	.11	.83	.54	.59	-					
6. DERS-Awareness	.02	.12	-.04	-.01	.05	-				

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7.	DERS-Strategies	.20	.90	.64	.72	.69	-.03	-		
8.	DERS-Clarity	.10	.58	<u>.28</u>	<u>.36</u>	<u>.34</u>	.58	<u>.39</u>	-	
9.	DASS-Depression	<u>.26</u>	.53	<u>.32</u>	<u>.35</u>	<u>.37</u>	.09	.59	<u>.37</u>	-
10.	DASS-Anxiety	.15	.23	.23	.20	.12	.08	.16	.23	.45 -

<TF>Note. **Bold** *rs* significant at $p < .001$; Underlined *rs* significant at $p < .05$ (two-tailed). Y-BOCS = Yale-Brown Obsessive Compulsive Scale; DERS = Difficulties in Emotion Regulation Scale; DASS = Depression Anxiety Stress Scales.

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