



The role of early maladaptive schemas in predicting exposure and response prevention outcome for obsessive-compulsive disorder

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ABSTRACT

This is the first study that explores whether early maladaptive schemas are related to treatment outcome for patients with obsessive-compulsive disorder (OCD). The sample consisted of 88 outpatients with a diagnosis of OCD who completed exposure and response prevention treatment. The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS), the Beck Depression Inventory and Young Schema Questionnaire – Short Form were administered before and after treatment. Regression analyses using post-treatment Y-BOCS as the dependent variable indicated that higher scores on the abandonment schema at pre-treatment were related to poor outcome and explained 7% of the variance in symptoms at post-treatment. Higher scores on the self-sacrifice schema at pre-treatment were related to good outcome and explained 6% of the variance in obsessive-compulsive symptoms at post-treatment. During treatment, only changes in the failure schema were significantly related to good outcome and explained 18% of the variance in symptoms at post-treatment.

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Introduction

One of the challenges facing cognitive behavioral therapy (CBT) today is developing effective therapies for “difficult-to-treat” patients. Although the efficacy of CBT for obsessive-compulsive disorder (OCD) has been well established in many studies (Abramowitz, 2006; Eddy, Dutra, Bradley, & Westen, 2004), approximately 50% of patients still do not respond optimally to CBT, including many who drop out or relapse (Baer & Minichiello, 1998; Cottraux, Bouvard, & Milliere, 2005; Stanley & Turner, 1995).

Several researchers have proposed that many patients with underlying personality disorders and characterological issues do not fully respond to traditional CBT (Beck & Freeman, 1990; Fals-Stewart & Lucente, 1993; Sookman & Steekete, 2010). These patients often have difficulties in forming therapeutic alliances, are unable or unwilling to comply with treatment protocols, have difficulty complying with homework exercises and have limited access to cognitions and emotions. These factors contribute to reduced CBT

response, particularly with short-term treatment protocols (Beck & Freeman, 1990; Young, Klosko, & Weishaar, 2003).

The prevailing view in contemporary clinical practice is that severe personality pathology has a negative impact on CBT outcome for OCD patients, but there is little empirical evidence supporting such a relationship. To date, most studies have focused on the influence of categorical Axis-II diagnoses on CBT response, and the findings from these studies have been inconsistent (Fricke et al., 2006; Keeley, Storch, Merlo, & Geffken, 2008). The most consistent finding to date is that schizotypal personality traits predict poorer treatment outcome (Keeley et al., 2008). Some have argued that findings related to the relationship between personality pathology and CBT response are inconsistent because personality characteristics are camouflaged when utilizing broad, categorical Axis-II diagnoses. These researchers (Rees, Anderson, & Egan, 2005) advocate for the use of dimensional measures that may more effectively identify underlying personality factors related to treatment outcomes for OCD patients.

Maladaptive cognitive schemas are proposed as the core of personality disorders (Beck & Freeman, 1990; Young et al., 2003). These schemas are thought to influence how people view themselves, others and the world. Given that personality pathology is

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quite common in OCD (Reich & Simonsen, 2008), examining underlying schemas among people with OCD is important in order to gain a deeper understanding of the relationship between personality pathology and treatment outcome. Increased knowledge about underlying schemas, particularly among treatment non-responders, could inform more comprehensive and individually tailored OCD treatment programs.

As an expansion of traditional CBT, Young and Klosko (1993) developed schema therapy to treat patients with chronic psychological disorders when CBT has been unsuccessful. Although they have not studied OCD directly, their model may be relevant for the treatment of OCD patients who are resistant to standard CBT. Schema therapy integrates aspects of other theoretical schools (e.g., psychodynamic, gestalt, attachment theory) into a richer, unified conceptual treatment model that addresses the core themes that are typically present among patients with personality pathology. A central assumption of the schema model is that the origins of most severe personality pathology can be traced to unmet emotional needs in childhood. The model posits that early maladaptive schema (EMS) emerge from these unmet needs and that these trait-like vulnerabilities contribute to the development of maladaptive coping styles. Fifteen EMS are grouped into the following four domains: disconnection (i.e., the beliefs that one's needs for safety, nurturance, empathy, acceptance and respect will not be met in a predictable manner), impaired autonomy (i.e., beliefs regarding one's ability to separate and function independently from others), exaggerated standards (i.e., rigidity) and impaired limits (i.e., deficiencies in self-discipline and in setting emotional and interpersonal limits) (Hoffart et al., 2005). According to Young and Klosko's (1993) theory, EMS related to basic safety, abandonment and abuse, are particularly important. These EMS are most closely related to traumatic events in childhood, which may result in insecure attachments and negatively affect the ability to form secure therapeutic relationships.

To our knowledge, only two studies have directly examined the EMS of patients with OCD, but only at a descriptive level. Lochner et al. (2005) compared patients with OCD ($n = 59$) and trichotillomania ($n = 26$) using Young's Schema Questionnaire (YSQ – Short Form) and found that patients with OCD reported more maladaptive schemas than patients with trichotillomania in five EMS. Unrelenting standards (i.e., the underlying belief that one must strive to meet very high internalized standards of behavior and performance, typically to avoid criticism) and self-sacrifice (i.e., excessive focus on voluntarily meeting the needs of others at the expense of one's own gratification in daily situations) evidenced the highest scores in both the OCD and trichotillomania samples. However, exclusion of male participants in this study reduces the generalizability of these findings.

In a cross-sectional study conducted by Atalay, Atalay, Karahan, and Çaliskan (2008), the YSQ-total score in the OCD group ($n = 45$) was significantly higher compared to the healthy control group ($n = 45$). Compared to the control subjects, social isolation, vulnerability to harm and pessimism were the most activated schemas among OCD patients. To a lesser degree, patients with OCD also scored significantly higher on eight additional maladaptive schemas (emotional deprivation, defectiveness, failure, incompetence, subjugation, unrelenting standards, entitlement and approval seeking) compared to controls. A weakness in this study was the exclusion of Axis-I and Axis-II comorbidity, resulting in an atypical OCD sample because treatment-seeking OCD patients typically present with multiple co-occurring diagnoses.

Nevertheless, none of these studies provided information concerning whether EMS predict who might profit from OCD treatment. To our knowledge, there are no outcome studies involving standard CBT for OCD that address this issue. However, there is some empirical

evidence that an extended, integrative CBT model focused on underlying schemas (Sookman & Pinard, 1999), can yield a positive outcome for patients who are resistant to standard CBT. In a recent book, Sookman and Steketee (2010) reported positive outcome data from 39 CBT-resistant OCD patients using a schema-based approach. The results were based on two studies (Sookman & Pinard, 1999; Sookman, Dalfen, Annable, & Pinard, 2003) that consisted of 7 and 32 patients, respectively. Results indicated that a total of 32 patients showed clinically significant improvement after once- or twice-weekly treatment sessions over a period of 10 months. The results also revealed that core beliefs/underlying schemas, measured with the Vulnerability Schemata Scale (Sookman, Pinard, & Beck, 2001), reliably improved for responders and did not change for non-responders.

The extended treatment length in the aforementioned studies of schema-based treatment of OCD (Sookman & Pinard, 1999; Sookman et al., 2003) likely played an important role in the positive outcomes observed. Personality trait variables, such as schemas, are by definition thought to be quite enduring and resistant to change, particularly in standard CBT for OCD. Although a few studies have found that standard CBT for OCD can lead to changes in personality variables [e.g., defense mechanisms (Albucher, Abelson, & Nesse, 1998) or personality disorders (McKay, Neziroglu, Todaro, & Yaryura-Tobias, 1996)], CBT alone is not likely to be of sufficient intensity or duration to impact enduring personality problems for most patients. Nevertheless, it remains unclear which maladaptive schemas do change as a result of standard CBT for OCD and for which patients these schema are likely to change.

The present study is the first to examine the role of EMS in the outcome of standard CBT for OCD. The main purpose of the present study was to explore whether EMS measured before treatment predicts changes in obsessive-compulsive symptoms after treatment. Based on Young and Klosko's (1993) theory, we expected that patients with higher scores on the schemas related to basic safety (i.e., abandonment and mistrust/abuse) would have poorer outcome. We also expected that patients who failed to experience clinically significant changes in obsessive-compulsive symptoms would generally have more personality pathology at pre-treatment compared to patients who experienced clinically significant improvement. Furthermore, we investigated whether changes in EMS were related to post-treatment improvement in obsessive-compulsive symptoms.

Method

Participants

A total of 88 outpatients with OCD from two separate studies¹ were included in the present investigation. Subjects were recruited by means of referrals from several psychiatric outpatient clinics, general practitioners, and through self-referrals from newspaper advertisements. Overall, 26 patients from study-sample I completed individual exposure and response prevention (ERP) treatment, whereas 62 from study-sample II completed ERP treatment in a group format. The purpose of merging the two studies was to increase the statistical power. Inclusion criteria included age between 18 and 65 and a primary diagnosis of OCD obtained via the Structured Clinical Interview for DSM-IV (SCID-1; First, Spitzer, Gibbon, & Williams, 1995). The SCID was administered by a trained, independent psychologist. Inclusion criteria also included a score of 16 or more on the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS;

¹ Study-sample I: participants recruited for individual ERP at several outpatient clinics in Middle Norway. Study-sample II: participants recruited for group ERP in one outpatient clinic in Southern Norway.

Goodman et al., 1989). Exclusion criteria included the presence of a current psychotic disorder, a current alcohol or drug abuse/dependence, the use of benzodiazepine medication, a high risk of suicide, or treatment with exposure therapy during the last 6 months. These exclusion criteria were designed to yield participants that would match patients who would typically receive diagnosis-specific treatment in a community clinic. During the course of the treatment, 3 patients dropped out of the individual treatment condition, and 9 patients dropped out of the group therapy. All but 2 patients were of Norwegian origin. Participants were asked to refrain from seeking other treatment during the time they received the ERP therapy. A detailed description of the demographic and diagnostic information of the total sample is provided in Table 1.

A total of 48.9% of the sample used selective serotonin-reuptake inhibitors (SSRI) or selective serotonin-norepinephrine reuptake inhibitors (SNRI) at intake. The patients were encouraged to maintain a steady dosage of medication throughout the period of treatment, but medication stability was not measured. One patient initiated SSRI/SNRI medication during the treatment whereas another patient reduced the dosage.

Most assessments and clinical sessions were audio- or video-taped. Inter-rater analysis was conducted on 21 randomly selected videos of diagnostic assessment that were coded by independent raters. The agreement rate for the OCD diagnosis was 100%, and a Pearson correlation of 0.88 was found for 34 Y-BOCS interviews.

Written informed consent was obtained from the entire sample following a complete description of the study. The study was approved by the Regional Ethics Committee for research with human subjects.

Treatment

The group treatment was adapted from an ERP manual developed by Himle et al. (2001). The group therapy included 6 participants and was led by one psychologist and one psychiatrist. The groups were conducted weekly for 12 weeks, and each session lasted 2.5 h. For a more detailed description of the group treatment manual, see Håland et al. (2010). The individual treatments were based on a standard ERP manual for individual ERP for OCD,

developed by Kozak and Foa (1997). The individual treatment sessions were 90 min in duration and delivered twice-weekly for the first two weeks and then weekly for a total of 15 sessions. The individual therapy providers included 3 psychologists, 1 psychiatrist, 1 social worker and 1 psychiatric nurse.

Measures

Yale-Brown Obsessive-Compulsive Scale (Y-BOCS)

The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989) was used to assess the intensity of OCD symptoms. The scale has separate indices that measure distress caused by obsessions and compulsions, which are combined to calculate a cumulative score. This total score is based on 10 items (5 describing obsessive symptoms, 5 describing compulsive symptoms) with scores from 0 to 4 (total score range: 0–40). Higher scores indicate greater OCD symptomatology. Y-BOCS has good psychometric properties and has been evaluated by Taylor (1998) as the best available instrument for assessing the response to OCD treatment. Cronbach's alpha was 0.69 at pre-treatment and 0.89 at post-treatment in the current study.

Beck Depression Inventory (BDI)

The Beck Depression Inventory (BDI; Beck & Steer, 1987) consists of 21 items with a range from 0 to 3 (total score range: 0–63). Higher scores reflect increasing levels of severity of depressive symptoms. The BDI has been widely used and has demonstrated high internal consistency and content validity in a number of studies (Beck, Steer, & Garbin, 1988). In the current sample, Cronbach's alpha for BDI at pre-treatment was 0.91.

The Young Schema Questionnaire – Short Form (YSQ-SF)

The Young Schema Questionnaire – Short Form (YSQ-SF; Young et al., 2003) is a 75-item self-report questionnaire that investigates the presence of the following 15 early maladaptive schemas (EMS): emotional deprivation, abandonment, mistrust, social alienation, defectiveness, incompetence, dependency, vulnerability to harm, enmeshment, subjugation of needs, self-sacrifice, emotional inhibition, unrelenting standards, entitlement and insufficient self-control. Each item is a statement of a character issue that the patient scores on a scale from 1 (does not fit) to 6 (fits perfectly). Examples of YSQ-SF items include the following: unrelenting standards: *Almost nothing I do is quite good enough, I can always do better*; abandonment: *I feel I lack a stable base of emotional support*; social isolation: *I don't fit in*; failure: *I am incompetent when it comes to achievement*; and emotional inhibition: *I find it embarrassing to express my feelings to others*. Higher scores indicate a greater presence of maladaptive schema. Adequate psychometric properties have been demonstrated for the YSQ-SF (Welburn, Coristine, Dagg, Pontefract, & Jordan, 2002). In the current sample, Cronbach's alpha for the YSQ-total at pre-treatment was 0.97.

Data analyses

Differences between study-samples I and II at baseline were analyzed with independent sample *t*-tests and chi-squared tests for continuous and categorical variables, respectively. For all analyses, completer analyses were used. Treatment effects were analyzed using paired sample *t*-tests. Effect sizes were calculated utilizing a formula derived from Cohen (1988) to establish that the treatments used in the study yielded results similar to other ERP and CBT treatments. In addition, the Jacobson and Truax (1991) two-fold criterion was used to determine the number of patients in the total sample who showed clinically significant change (CSC) after treatment. According to these authors, CSC is obtained if (a) a symptom

Table 1

Characteristics of the group sample, individual sample and total sample at pre-treatment.

Variables	Group sample (n = 62)	Individual sample (n = 26)	Total sample (n = 88)
Mean (SD)			
Age	35.1 (12.0)	32.7 (10.1)	34.4 (11.5)
Duration of OCD in years	16.0 (10.3)	14.0 (12.9)	15.4 (11.1)
Debut age of OCD	19.0 (9.8)	19.7 (9.7)	19.2 (9.7)
Y-BOCS total	24.0 (4.3)	25.0 (4.3)	24.3 (4.2)
YSQ-total	35.2 (11.8)	34.8 (12.7)	35.1 (12.0)
BDI-total	16.5 (10.5)	16.9 (10.6)	16.7 (10.5)
% (n)			
Female gender	74.2 (46)	69.2 (18)	72.7 (64)
Married/cohabitant	66.1 (41)	61.5 (16)	64.8 (31)
Working/studying	59.7 (37)	53.8 (14)	58.0 (51)
Using SSRI/SNRI	48.4 (30)	50.0 (13)	48.9 (43)
No comorbidity	41.9 (26)	26.9 (7)	37.5 (33)
Depressive disorder	29.0 (18)	46.1 (12)	34.1 (30)
Panic/agoraphobia	17.7 (11)	19.2 (5)	21.2 (16)
Social anxiety disorder	22.6 (14)	23.1 (6)	22.7 (20)
GAD	19.4 (12)	15.4 (4)	18.2 (16)
Specific phobia	12.9 (8)	11.5 (3)	12.5 (11)
PTSD	9.7 (6)	3.8 (1)	8.0 (7)
Eating disorder	9.7 (6)	0 (0)	6.9 (6)

No statistically significant differences were found between the group- and individual sample ($p < 0.05$).

score is in the non-dysfunctional range at post-treatment and (b) a symptom score had decreased by a reliable amount exceeding the measurement error (reliable change index). Following Fisher and Wells' (2005) method, the reliable change index (RCI) in the present study was calculated based on the test–retest reliability of Y-BOCS ($r = 0.61$). The Fisher and Wells (2005) cut-off score of 14 or below was used to determine non-clinical range. To be classified as recovered (achieved CSC) in the present study, a patient's Y-BOCS total score had to decrease by at least 8 points from pre-treatment to post-treatment, and his or her final Y-BOCS total score had to be 14 or less. Comparisons of recovered and non-recovered patients' pre-treatment scores on YSQ-total scores and the various EMS were calculated using independent *t*-tests. These analyses were followed by correlation analyses that investigated the relationship between the changes in obsessive-compulsive symptoms, changes in depression and the changes in EMS. Correlation analyses between EMS, obsessive-compulsive symptoms and depression at pre-treatment were also conducted. We then conducted two regression analyses for predicting outcome with Y-BOCS post-treatment as the dependent variable. The statistical assumption for regression analyses was checked with residual plots and histograms for residuals, which showed the normal distribution of the residuals. In the first regression analysis we explored whether pre-treatment EMS were related to treatment outcome measured with Y-BOCS. In the second regression analysis we investigated whether the change in EMS was related to the outcome in Y-BOCS.

Results

Preliminary analyses

As shown in Table 1, independent sample *t*-tests and chi-squared tests showed that study-samples I and II were not statistically different in terms of relevant demographic and clinical variables at pre-treatment. The differences in slopes between predictors and outcomes for the two samples were assessed using regression analyses, and no significant differences were found.

Effect of CBT on obsessive-compulsive symptoms and EMS

The pre–post effects on obsessive-compulsive symptoms and the EMS are presented in Table 2. Analyses with paired sample *t*-test showed that Y-BOCS and YSQ-total scores decreased significantly from pre-treatment to post-treatment. To reduce the risk of Type I errors due to multiple comparisons, a Bonferroni corrected alpha level of 0.003 was chosen for the EMS. Five of the EMS decreased significantly from pre-treatment to post-treatment. The Y-BOCS changes indicated a large treatment effect size, while the EMS showed small to medium effect sizes. Independent samples *t*-test revealed that individual treatment was more effective in reducing OCD symptoms than group therapy at post-treatment, $t(86) = 2.33$, $p = 0.025$. However, there were no significant differences in the YSQ-total post scores between individual and group treatment.

Clinically significant change analyses

According to the criteria for treatment response, 43% achieved clinically significant change (CSC) or were recovered, and 57% failed to experience clinically significant changes (non-CSC). These results are in line with other research using exposure and response prevention for OCD. We investigated the distribution of pre-treatment YSQ-total scores and the EMS among the CSC and the non-CSC groups. Independent samples *t*-test revealed that patients who failed to experience CSC in obsessive-compulsive symptoms

Table 2

Paired sample *t*-test and effect sizes (ES) for pre-treatment and post-treatment tests of obsessive-compulsive symptoms and early maladaptive schemas ($N = 76$).

Measure	Pre-treatment		Post-treatment		<i>t</i>	ES
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Y-BOCS	24.30	4.30	13.97	6.29	14.69**	1.91
YSQ-total	2.33	0.85	2.00	0.77	4.22**	0.34
Emotional deprivation	2.04	1.00	1.90	0.94	ns.	
Abandonment	2.76	1.39	2.56	1.33	ns.	
Mistrust/abuse	1.95	1.06	1.77	0.95	ns.	
Social isolation	2.28	1.31	1.98	1.15	ns.	
Defectiveness/shame	2.02	1.33	1.77	1.09	ns.	
Dependence/incompetence	2.09	1.14	1.88	0.99	ns.	
Vulnerability to harm and illness	2.35	1.24	1.89	1.04	3.65**	0.34
Enmeshment	1.86	1.06	1.70	0.93	ns.	
Failure	2.24	1.3	1.89	1.07	3.35**	0.29
Subjugation	2.53	1.32	2.12	1.10	3.93**	0.34
Self-sacrifice	3.13	1.12	2.90	0.98	ns.	
Emotional inhibition	2.17	1.09	1.95	1.00	ns.	
Unrelenting standards	3.41	1.3	3.00	1.36	3.59**	0.31
Entitlement	2.06	0.89	1.86	0.86	3.08*	0.23
Insufficient self-control	2.37	1.05	2.05	1.0	ns.	

Note: Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, YSQ = Young Schema Questionnaire, * $p < 0.003$, ** $p < 0.001$, ns. = Non-significant.

had significantly higher pre-treatment scores on abandonment compared to the patients who experienced CSC, $t(86) = 2.35$, $p = 0.021$. No group differences were found between the two outcome categories with respect to pre-treatment YSQ-total scores and the other EMS. When comparing the two categories of outcome (CSC and non-CSC) with independent *t*-tests, a group difference was found in post-treatment YSQ-total scores, $t(74) = 2.31$, $p = 0.024$.

Correlation analyses

Correlation coefficients were conducted to examine multicollinearity among the predictor variables. As shown in Tables 3 and 4, significant associations were observed between the dependent variables and several of the predictor variables. Statistical tests indicated that multi-collinearity was not a significant problem. Variance inflation factors (VIF) were computed for each predictor variable to detect multi-collinearity. As a rule of thumb, a VIF > 10

Table 3

Correlations between changes in early maladaptive schemas, changes in depression and obsessive-compulsive symptoms.

	1	2	3	4
1 Y-BOCS post				
2 Y-BOCS Δ	–0.78**			
3 BDI Δ	–0.22	0.38**		
4 YSQ-total Δ	–0.34**	0.46**	0.49**	
Abandonment Δ	–0.10	0.17	0.27*	0.44**
Emotional deprivation Δ	–0.17	0.12	0.18	0.43**
Mistrust/abuse Δ	–0.10	0.09	0.10	0.64**
Social isolation Δ	–0.23*	0.34**	0.31**	0.78**
Defectiveness/shame Δ	–0.30**	0.30**	0.26*	0.70**
Failure Δ	–0.36**	0.45**	0.17	0.62**
Dependence/incompetence Δ	–0.25*	0.29*	0.48**	0.69**
Vulnerability to harm and illness Δ	–0.23	0.38**	0.46**	0.75**
Enmeshment Δ	–0.20	0.28*	0.26*	0.66**
Subjugation Δ	–0.20	0.42**	0.44**	0.73**
Self-sacrifice Δ	–0.18	0.14	0.24*	0.48**
Emotional inhibition Δ	–0.22	0.32**	0.21	0.66**
Unrelenting standards Δ	–0.28*	0.31**	0.41**	0.58**
Entitlement Δ	–0.10	0.22	0.25*	0.44**
Insufficient self-control Δ	–0.17	0.20	0.26*	0.64**

**Correlation is significant at $p < 0.01$, *correlation is significant at $p < 0.05$. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, YSQ = Young Schema Questionnaire, Δ = change scores, BDI = Beck Depression Inventory.

Table 4

Correlations between early maladaptive schemas, obsessive-compulsive symptoms and depression at pre-treatment.

	1	2	3
1 Y-BOCS pre			
2 Y-BOCS post	0.27*		
3 BDI-pre	0.43**	0.14	
Abandonment	0.15	0.23*	0.46**
Emotional deprivation	0.11	0.05	0.36**
Mistrust/abuse	0.19	0.07	0.44**
Social isolation	0.27*	0.08	0.48**
Defectiveness/shame	0.07	-0.06	0.41**
Failure	0.19	-0.01	0.46**
Dependence/incompetence	0.21	0.10	0.48**
Vulnerability to harm and illness	0.43**	0.19	0.56**
Enmeshment	0.10	0.06	0.29**
Subjugation	0.30**	0.04	0.52**
Self-sacrifice	0.26*	-0.14	0.50**
Emotional inhibition	0.08	-0.11	0.28**
Unrelenting standards	0.21*	0.01	0.41**
Entitlement	0.18	0.12	0.15
Insufficient self-control	0.19	0.03	0.39**

**Correlation is significant at $p < 0.01$, *correlation is significant at $p < 0.05$. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, BDI = Beck Depression Inventory.

indicates problematic collinearity (O'Brien, 2007). VIF was not above 2 and thus were well below the suggested cut-off values for severe collinearity.

The predictive value of pre-treatment EMS on treatment outcome

In light of the restricted sample size and the large number of predictors and potential interactions, we first conducted separate linear regression analyses on the 15 EMS variables rather than on all of the predictors at once. Variables with a significance level below $p < 0.1$ were included in the further analysis; only abandonment and self-sacrifice met these criteria.

Due to the lack of potential predictors and the limited sample size, only pre-treatment levels of obsessive-compulsive symptoms and pre-treatment levels of depression were controlled. A linear regression analysis was utilized to determine whether some EMS independently predict outcome. Pre-treatment Y-BOCS was entered in the first step of regression followed by pre-treatment BDI and the EMS at steps 2 and 3, respectively. Forward regression was utilized in the third step to explore the independent contribution of each schema. The results indicated that obsessive-compulsive symptoms at pre-treatment were related to outcome and explained 7% of the variance. Depression in the second step did not make a significant contribution. For the third step, self-sacrifice and abandonment explained an additional 6 and 7% of the variance in Y-BOCS. A summary of the regression analyses is provided in Table 5. Of the 21 patients with relatively high scores on abandonment (mean scores ≥ 4) at pre-treatment, only 5 patients were defined as recovered or achieved CSC at post-treatment, and 16 patients did not obtain CSC.

The predictive value of change in EMS on treatment outcome

For the second regression analysis, we explored the impact of the EMS change scores on obsessive-compulsive symptoms while controlling for changes in depression. Changes in depression were controlled because several studies have shown that change in depression is related to treatment outcome (Abramowitz, Franklin, Street, Kozak, & Foa, 2000). To determine which YSQ variables to include in the regression equations, separate preliminary regression analyses were conducted for each schema. The EMS change scores with a significance level below 0.1 were included in the regression model, and these schemas were as follows: defect/shame, vulnerability to

Table 5

Statistics for each step of the regression with post-treatment Y-BOCS regressed on pre-treatment Y-BOCS, pre-treatment depression and pre-treatment early maladaptive schemas predictors ($N = 88$).

		F cha	R ²	R ² cha	B	SE B	β	t
Step 1		6.5	0.07	0.07*				
	Y-BOCS pre				0.39	0.15	0.27	2.55**
Step 2		0.09	0.07	0.00				
	Y-BOCS pre				0.37	0.17	0.25	2.17*
	BDI-pre				0.02	0.07	0.03	0.30
Step 3		5.93	0.13	0.06*				
	Y-BOCS pre				0.38	0.16	0.27	2.28*
	BDI-pre				0.10	0.08	0.18	1.38
	Self-sacrifice				-1.61	0.66	-0.29	-2.44*
		6.73	0.20	0.07**				
	Y-BOCS pre				0.40	0.16	0.28	2.51**
	BDI-pre				0.04	0.09	0.06	0.50
	Self-sacrifice				-1.95	0.65	-0.35	-2.99**
	Abandonment				1.38	0.53	0.29	2.59**

Note: Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, BDI = Beck Depression Inventory.

* $p < 0.05$, ** $p < 0.01$.

harm, social isolation, failure, dependence/incompetence, enmeshment, subjugation, emotional inhibition, unrelenting standards, and insufficient self-control. Forward regression was employed to determine whether some of the schemas were more important than others. The pre-treatment levels of obsessive-compulsive symptoms were entered in step 1 and explained 9% of the variance in Y-BOCS. Only one schema, change in failure, was significant and explained 18% of the variance. Change in depressed mood was entered in the second step but did not add significant variance in the model. Due to the large number of predictors, only the significant predictors in the regression analyses are displayed in Table 6.

To obtain more detailed information about the significant predictor found in the regression analyses, we compared the two categories (CSC and non-CSC) of outcome using independent t -tests and found a group difference in changes on the failure schema $t(74) = -2.5$, $p = 0.015$.

Discussion

The present findings related to early maladaptive schemas extend previous research by providing more information than would be available through categorical personality diagnosis alone. The main findings demonstrated that higher pre-treatment scores on the abandonment schema were related to poor outcome and that higher pre-treatment scores on self-sacrifice schema were related to good outcome. Furthermore, the results showed that decreases in failure schema during treatment were related to good outcome.

Young et al. (2003) theorize that abandonment schema involves the perception that significant others are emotionally unstable and unpredictable. Persons who score high on this schema typically

Table 6

Summary of the regressions with post-treatment Y-BOCS regressed on pre-treatment Y-BOCS and change in early maladaptive schemas predictors ($N = 76$).

		F cha	R ²	R ² cha	B	SE B	β	t
Step 1		6.80	0.09	0.09*				
	Y-BOCS pre				0.49	0.19	0.28	2.62*
Step 2		16.62	0.27	0.18***				
	Y-BOCS pre				0.63	0.17	0.38	3.65**
	Failure Δ				-3.09	0.76	0.43	4.08***

Note: Y-BOCS = Yale-Brown Obsessive-Compulsive Scale.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

experienced early family relationships as detached, cold and rejecting. Patients with abandonment schema constantly expect to lose the people closest to them. To prevent other persons from leaving or avoid the pain of being rejected, typical maladaptive coping styles include clinging to significant others and avoiding intimate relationships. Consequently, patients with this schema often have difficulties forming positive therapeutic alliances, especially early in treatment, thus mirroring their problems in relating to others outside of therapy (Young et al., 2003).

Previous research has shown that abandonment is an important schema in borderline personality disorder (Arntz, Dietzel, & Dreessen, 1999; Ball & Cecero, 2001; Joveev & Jackson, 2004), a disorder that is a challenge for many therapists. In Young's schema model (Young & Klosko, 1993), the development of the abandonment schema is strongly influenced by attachment theory and is based on the work of Ainsworth and Bowlby (1991).

In a review article, Doron and Kyrios (2005) argued that knowledge from current developmental and attachment research has not received sufficient attention in cognitive treatment models of OCD, despite evidence that insecure attachment in general is related to psychopathology. A study of interest in this area has found that separation anxiety and attachment fears characterized OCD patients more than patients with major depression or normal controls (Vogel, Stiles, & Nordahl, 2000). A recent study (Doron, Moulding, Kyrios, Nedeljkovic, & Mikulincer, 2009) showed that high attachment anxiety (expressed as a strong fear of abandonment and separation) is linked with OCD-related beliefs (e.g., overestimation of threat, perfectionism). The present findings extend the focus of current OCD research, supporting the above-mentioned view that underlying schemas related to attachment are important considerations when attempting to improve the currently available OCD treatment.

The results of the current study may also indirectly support prior research (Chambless & Steketee, 1999; Steketee, Lam, Chambless, Rodebaugh, & McCullough, 2007), indicating that family hostility is associated with poorer outcome.

Because abandonment schema has the potential to sabotage traditional CBT, a possible clinical implication of this finding may be to expand the standard CBT by focusing on building a strong and secure therapeutic relationship for patients with high scores on this schema. According to Young et al. (2003), a strong therapeutic relationship is critical in helping patients with an abandonment schema feel more secure, which may reduce their use of maladaptive coping strategies.

The emphasis on the therapist–patient relationship is consistent with the findings of Baldwin, Wampold, and Imel (2007), who demonstrated that therapists who formed stronger alliances with their patients showed better outcomes than therapists with weaker alliances. Increased emphasis on socialization to the treatment model may also be important for patients with an abandonment schema. Although not directly examined in the current study, clinical impressions gained primarily from individuals participating in group therapy indicated that most patients with high scores on the abandonment schema struggled with applying the principles congruent with the ERP model. Socialization to treatment, a component of therapeutic alliance, is in fact associated with higher levels of concordance and less resistance during treatment sessions (Daniels & Wearden, 2011). An additional clinical implication may be that non-responders with abandonment issues could benefit from integrative treatment models that focus on factors including underlying schemas and attachment history (e.g., Sookman & Steketee, 2007).

Another clinical implication of note is in accordance with Doron and Moulding (2009), who suggest that refractory OCD clients with high attachment anxiety should be offered attachment-based CBT. Within this treatment approach, the fear of abandonment is

considered as the “engine” of OCD and is targeted in several ways (e.g., exploring the relationship between fear of abandonment and OCD-related cognitions as perfectionism and overestimation of threat; devising behavioral experiments aimed at increasing tolerance for abandonment-related fears; and exploring and challenging the link between fear of abandonment and perceptions of self-worth).

The results also showed that self-sacrifice at pre-treatment was significantly associated with good outcome. A possible interpretation of this finding is that individuals with a self-sacrifice schema are more inclined to comply with treatment due to their excessive tendency to meet the needs of others, and then probably also the therapist's expectations. This is in line with some previous studies that have found a favorable effect on OCD treatment outcome associated with dependent personality traits (Fals-Stewart & Lucente, 1993; Steketee, 1990).

Contrary to our expectations, the results did not show that non-responders had generally higher pre-treatment maladaptive schemas levels compared to responders. Hence, there were no significant differences between the patients who obtained clinically significant changes in obsessive-compulsive symptoms and the patients who did not with respect to pre-treatment YSQ-total scores. These results are encouraging for therapists who work with OCD patients with high total YSQ scores. One possible explanation for the latter findings might be that schemas do not equally influence OCD treatment outcomes. The conditional schema (e.g., self-sacrifice and unrelenting standards) can be socially acceptable and even serve as a coping strategy. Therefore, it may cancel out more negative schemas and thereby mask a possible total score effect. A recent study found that some EMS (self-sacrifice, unrelenting standards, and entitlement) were positively related to resolution of psychosocial developmental task resolution during outpatient therapy (Thimm, 2010).

From the beginning to the end of treatment, the YSQ-total scores and five of the EMS scores (vulnerability to harm, failure, subjugation, unrelenting standards and entitlement) decreased significantly. This is noteworthy because schemas are considered to be quite enduring and resistant to change, particularly in a brief intervention. However, the effect sizes indicated that the changes in schemas were relatively small and therefore, may be of limited clinical significance. Change in the failure schema was the only EMS that was related to the outcome in obsessive-compulsive symptoms after treatment. The failure schema is defined as the belief that one is fundamentally inadequate relative to others and therefore, destined to fail in areas of achievement (e.g., school, career, sports) (Young et al., 2003). It is possible to interpret the decrease in failure schema as an expression of greater confidence after completing successful treatment. It is likely that failure schema are specifically evoked and challenged within the ERP context given its strong emphasis on teaching patients new coping strategies. The design of the present study cannot address issues concerning the causal relationship between change in EMS and symptom improvement during treatment. Given that treatment was strictly focused on the specific symptoms of obsessive-compulsive disorder, schema changes were not likely due to the direct effects of the ERP-focused treatments. It is therefore likely that improvement in symptoms influenced improvement in EMS.

Congruent with Lochner et al. (2005), but contrary to the study of Atalay et al. (2008), the current results indicated that unrelenting standards were the highest EMS in the sample. However, due to selective inclusion criteria, the representativeness of the EMS in these two studies is unclear, which makes a comparison with the current results difficult. The total pre-treatment YSQ score in the current study was comparable with a large Norwegian sample (Hoffart et al., 2005) consisting of non-psychotic patients with a wide range of diagnoses (2.4 vs. 2.3 in our sample). This indicates

that patients in the current study did not have generally low EMS scores. Although most EMS scores were slightly lower in the present sample, the EMS scores were higher on three EMS: (abandonment: 2.62 vs. 2.76; unrelenting standards: 3.0 vs. 3.4; and entitlement: 1.85 vs. 2.1) compared to the study by Hoffart et al. (2005).

Limitations

Some limitations call for caution when drawing conclusions from the current study.

Although the findings are suggestive, inferences about causality cannot be made. The identification of a predictor or moderator may lead to hypotheses about possible causal roles, which can be tested in future studies specifically designed for those purposes. Another limitation of this study was the relatively small sample size (88/76 patients) relative to the number of predictors. This can lead to rather unstable linear regression equations, which primarily affect the estimation of linear regression models and increase the possibility for Type I errors. A replication with a larger sample would be desirable to determine the robustness of the reported effects, particularly the finding that abandonment is related to poor treatment outcome. Another limitation was the missing YSQ data for 12 patients at post-treatment, which may have led to a skewed sample. It is possible that the patients with the greatest personality problems were not included in the analyses. However, a closer examination of the treatment outcome categories for these patients revealed that only 3 of the patients were unchanged after treatment, 4 were improved and 5 were recovered, which increases the likelihood that missing data occurred at random. The current study also does not include follow-up data. Therefore, further research is necessary to assess the long-term influence of schema on treatment outcome. Another limitation is that the study relied entirely on a single self-report measure to test underlying schemas. By their very nature schemas are partially implicit and not accessible to awareness through self-reports. Other imagery based exercises often based on the therapy relationship may be of use to measuring more subtle aspects of schemas. It would also be interesting to utilize other types of measurements to study related topics, such as attachment and more specific patterns of parenting. In-depth qualitative studies of single cases could also contribute to a deeper understanding of how underlying schemas affect treatment outcome. Of note, the study was conducted with a Norwegian sample and future studies on samples from other cultures are important given cultural influences on schemas.

A strength of the current study is that, unlike most randomized controlled trials, participants with comorbid personality disorders were not excluded from the study. The patients in the current study are likely more representative of the typical referred outpatient, increasing the generalizability of the results.

In summary, two schemas, abandonment and self-sacrifice, were significantly related to treatment outcomes. Further research on underlying schemas can contribute to existing OCD models and may enhance our understanding of therapeutic processes of importance when dealing with clients suffering from OCD.

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