



The relationship between obsessive beliefs and symptom dimensions in obsessive-compulsive disorder

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ABSTRACT

Research findings on the specific relationships between beliefs and OCD symptoms have been inconsistent, yet the existing studies vary in their approach to measuring the highly heterogeneous symptoms of this disorder. The Dimensional Obsessive-Compulsive Scale (DOCS) is a new measure that allows for the assessment of OCD symptom *dimensions*, rather than types of obsessions and compulsions per se. The present study examined the relationship between OCD symptom dimensions and dysfunctional (obsessive) beliefs believed to underlie these symptom dimensions using a large clinical sample of treatment-seeking adults with OCD. Results revealed that certain obsessive beliefs predicted certain OCD symptom dimensions in a manner consistent with cognitive-behavioral conceptual models. Specifically, contamination symptoms were predicted by responsibility/threat estimation beliefs, symmetry symptoms were predicted by perfectionism/certainty beliefs, unacceptable thoughts were predicted by importance/control of thoughts beliefs and symptoms related to being responsible for harm were predicted by responsibility/threat estimation beliefs. Implications for cognitive conceptualizations of OCD symptom dimensions are discussed.

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Obsessive-compulsive disorder (OCD) is a heterogeneous condition characterized by recurrent unwanted thoughts, images or impulses (obsessions) that provoke anxiety, as well as efforts to resist or neutralize the obsessional anxiety through avoidance behavior and deliberate overt or covert actions (i.e., compulsive rituals; *APA, 2000*). The thematic diversity of obsessions and rituals is well known (e.g., *Foa & Kozak, 1995*). Obsessions for example, might relate to contamination, violence and harm, mistakes, exactness, sex, and religion. Rituals typically take the form of compulsive washing, checking, repeating routine behaviors, and ordering or arranging; but might also involve covert acts such as praying, mental analyzing, and mentally “replacing” (neutralizing) unwanted thoughts with more acceptable ones.

Emerging empirical evidence suggests that the variations in OCD symptoms can be distilled down to a smaller number of symptom dimensions; and OCD is therefore increasingly being recognized as a dimensional disorder (e.g., *McKay et al., 2004; Mataix-Cols, Rosario-Campos, & Leckman, 2005*). The most recent

and consistent data indicate four symptom dimensions, including: (a) contamination-related obsessions and cleaning rituals, (b) obsessional doubts about being responsible for harm/mistakes and checking/reassurance-seeking rituals, (c) obsessions concerning “incompleteness” and the need for symmetry or exactness and ordering or arranging rituals, and (d) unacceptable obsessional thoughts concerning violent, sexual, and religious themes along with covert mental rituals or other rituals aimed to neutralize these obsessional thoughts (e.g., *Abramowitz et al., 2010; Mataix-Cols et al., 2005*). For the most part, however, studies of the structure of OCD symptoms have utilized techniques such as factor analysis, and have not been theory-driven. Thus, empirically examining the extent to which the identified symptom dimensions correspond to theoretical models of OCD can help in understanding the phenomenology of this condition and the development of dimension-specific interventions.

A great deal of progress has been made in cognitive-behavioral approaches to OCD over the past few decades (*Frost & Steketee, 2002*). Early cognitive conceptualizations of OCD (e.g., *Salkovskis, 1985*), were founded on *Beck's (1976)* basic cognitive approach to emotional disorders, which suggests that maladaptive emotions and behaviors result from dysfunctional beliefs and interpretations (i.e., cognitions). More recently, cognitive conceptualizations of

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OCD have become more focused and sophisticated, as authors have developed belief-based models for particular presentations of OCD (e.g., *Rachman, 2002, 2004*). The Obsessive Compulsive Cognitions Working Group (*OCCWG, 2001*) developed an instrument to assess these beliefs—the Obsessive Beliefs Questionnaire (OBQ). The OBQ was later condensed to three factor-analytically distinguishable domains of “obsessive” beliefs: (a) inflated responsibility and the tendency to overestimate threat, (b) the need for perfectionism and certainty, and (c) the overimportance and need to control thoughts (*OCCWG, 2005*). While there is evidence to suggest that some of these beliefs are not specific to OCD (*Tolin, Worhunsky, & Maltby, 2006*), the OBQ is frequently used in research on the cognitions involved in OCD.

Two cluster analytic studies found that some individuals with OCD, or certain presentations of the disorder, do not show elevated levels of the three domains of obsessive beliefs (*Calamari et al., 2006; Taylor et al., 2006*). Although research using additional statistical methods is needed, one explanation for these findings is that certain OCD symptom dimensions are associated with certain domains of obsessive beliefs, but not with others. Accordingly, some authors have proposed that particular obsessive beliefs are associated with particular themes of OCD symptoms. *Jones and Menzies (1997)* and *Rachman (2004)*, for example, postulated that contamination symptoms are associated with overestimates of threat, such as exaggerated estimates of the probability and severity of becoming ill from exposure to feared contaminants. *Rachman (2004)* further proposed that contamination obsessions involving fears of spreading germs to others were associated with inflated estimates of responsibility. *Rachman (2002)* suggested that checking rituals—which serve to prevent harm to self and others—are also associated with inflated estimates of responsibility for harm, as well as the tendency to overestimate the likelihood and severity of harm, should it occur. *Rachman (1997)* and *Purdon (2008)* have implicated beliefs concerning the overimportance of, and the need to control, thoughts (e.g., “having repetitive sexual thoughts means I am immoral or perverted”) in obsessional symptoms involving unwanted or morally unacceptable thoughts, images, and impulses (e.g., regarding sex, violence, and religion). Finally, *Summerfeldt (2008)* emphasized the relationship between beliefs about the need for perfection or certainty and OCD symptoms relating to incompleteness, symmetry, and ordering and arranging rituals.

To date, several investigations using clinical (*Abramowitz & Deacon, 2006; Julien, O'Connor, Aardema, & Todorov, 2006; OCCWG, 2005; Tolin, Brady, & Hannan, 2008*) and nonclinical samples (*Myers, Fisher, & Wells, 2008; Tolin, Woods, & Abramowitz, 2003*) have examined relationships between OCD symptoms and cognitive variables; however, their findings have been inconsistent. Checking symptoms, for example, were associated with inflated perceptions of responsibility and threat in some student samples (*Myers et al., 2008; Tolin et al., 2003*), but with the need for perfectionism and certainty in samples of OCD patients (*Julien et al., 2006; OCCWG, 2005*). In yet another clinical sample, checking symptoms were not predicted by any obsessive beliefs (*Tolin et al., 2008*). Washing symptoms have been associated with inflated estimates of responsibility and threat in some (*OCCWG, 2005; Tolin et al., 2008*), but not all studies (*Julien et al., 2006*). Finally, beliefs about the importance of and need to control thoughts predicted obsessional symptoms in some studies (*Julien et al., 2006; Tolin et al., 2008, 2003*), but not in others (*OCCWG, 2005*; once depression and anxiety were included as covariates).

What might account for the discrepant findings reviewed above? One possibility is the way OCD symptoms were conceptualized and assessed in these studies. All of these studies, for example, used symptom measures such as the Padua Inventory-

Revised (PI-R; *Burns, Keortge, Formea, & Sternberger, 1996*) and Obsessive-Compulsive Inventory-Revised (OCI-R; *Foa et al., 2002*), which assess more or less specific sorts of obsessions and rituals (e.g., “I need things to be arranged in a particular order”), rather than assessing the severity of the symptom *dimension* (e.g., symmetry, responsibility for harm, etc.). Moreover, these instruments assess obsessions separately from rituals. Yet this is inconsistent with the most up to date structural analyses of OCD symptoms indicating broader symptom dimensions comprised of certain obsessions *and* rituals. A related limitation is that because these instruments emphasize the overt *form* of obsessions and rituals, the *function* of these symptoms is overlooked. Indeed, seemingly similar overt symptoms may have different functions; even cutting across symptom dimensions. For example, ordering and arranging rituals sometimes function to reduce feelings of “incompleteness” (i.e., symmetry/exactness symptom dimension), but may also function to reduce obsessions about harm or bad luck (e.g., my mother will die if I don't eat my food in the “correct order”; i.e., the responsibility for harm dimension). Because ordering rituals may have different functions, the presence of ordering per se is not necessarily informative about its underlying cognitive basis.

To this end, the Dimensional Obsessive-Compulsive Scale (DOCS; *Abramowitz et al., 2010*), is a new measure that assesses the severity of the four most empirically supported OCD symptom dimensions: contamination, responsibility for harm and mistakes, symmetry/ordering, and unacceptable thoughts (e.g., *Mataix-Cols et al., 2005; McKay et al., 2004*). The DOCS is unique in that it affords an assessment of OCD symptoms based on function rather than form. For example, ordering rituals in response to a sense of “incompleteness” or “not just right” feelings are assessed on a separate dimension (i.e., symmetry dimension) from ordering rituals which function to reduce fears of causing (or failing to prevent) harm (i.e., responsibility for harm and mistakes dimension). Similarly, checking rituals that pertain to inspecting for contaminants are assessed on the contamination dimension, while checking locks and appliances are assessed on the responsibility for harm dimension. The DOCS also assesses multiple empirically-based parameters of severity (frequency, avoidance, distress, and functional interference; *Deacon & Abramowitz, 2005*) for each of the four OCD symptom dimensions. Accordingly, the DOCS may be better suited than other symptom measures for investigating the relationships between OCD symptoms and dysfunctional beliefs.

The present study therefore used the DOCS to investigate the relationship between OCD symptom dimensions and obsessive belief domains in a large sample of OCD patients. On the basis of aforementioned conceptual models of the four OCD symptom dimensions, we hypothesized that (a) the contamination symptom dimension would be most strongly associated with obsessive beliefs concerning inflated estimates of responsibility and threat; (b) the symptom dimension involving obsessional doubts about being responsible for harm and mistakes would also be most strongly associated with inflated estimates of responsibility and threat; (c) the symmetry dimension would be most strongly associated with beliefs about the need for perfectionism and certainty; and (d) the unacceptable thoughts symptom dimension would be most strongly associated with beliefs about the importance of, and need to control, thoughts.

Method

Participants and procedure

The study sample consisted of 135 adults diagnosed with OCD who presented for evaluation and treatment at one of three OCD clinics: the Anxiety and Stress Disorders Clinic at the University of

North Carolina—Chapel Hill ($n = 36$), the OCD Center at Rogers Memorial Hospital in Oconomowoc, Wisconsin ($n = 88$), and the Kansas City Center for Anxiety Treatment in Overland Park, Kansas ($n = 11$). All individuals met DSM-IV-TR criteria for OCD as determined via a structured or semistructured interview such as the Anxiety Disorders Interview Schedule (ADIS; Di Nardo, Brown, & Barlow, 1994), used in the Kansas and Wisconsin sites or the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) used at the North Carolina site. For all participants OCD was the principal diagnosis and main presenting concern for treatment. The sample was 58% female, 96% Caucasian, and had a mean age of 31.1 ($SD = 11.2$; range = 18–70). There were no differences across the sites in terms of age, $F(2,132) = .67$, $p > .05$, sex, $\chi^2(1) = 1.25$, $p > .05$ or ethnicity, $\chi^2(1) = 1.08$, $p > .05$.

The procedures for diagnosis, assessment, and inclusion in the study were as follows: As part of their evaluation, participants underwent a 1.5 h interview with a trained assessor who administered the diagnostic interview and conducted a functional assessment of OCD symptoms. Interviewers had received training in the assessment of OCD by attending didactic seminars, observing the administration of the measures by an experienced clinician, and then administering the interview under observation by a more senior investigator who provided constructive feedback. Although interrater reliability for the diagnosis was not formally examined, all assessors met with their site's clinic director to discuss diagnostic impressions, case conceptualization, and to formulate treatment recommendations for each patient. Patients were only included in the present study if there was 100% interrater agreement on OCD as the primary diagnosis. Patients also completed the self-report questionnaires described below as part of their assessment.

Measures

Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010)

The DOCS is a 20-item self-report measure that assesses the severity of the four most consistently replicated OCD symptom dimensions (which correspond to four DOCS subscales): (a) contamination, (b) responsibility for harm and mistakes, (c) symmetry/ordering, and (d) unacceptable thoughts. To accommodate the heterogeneity of OCD symptoms, and the presence of obsessions and rituals within each symptom dimension, each subscale begins with a description of the symptom dimension along with examples of representative obsessions and rituals. The examples clarify the form and function of each dimension's fundamental obsessional fears, compulsive rituals, and avoidance behaviors. Within each symptom dimension, five items (rated 0 to 4) assess 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 DOCS subscales have excellent reliability in clinical samples ($\alpha = .94-.96$) and the measure converges well with other measures of OC symptoms (Abramowitz et al., 2010). Reliability of the DOCS subscales in the present sample were in the excellent range ($\alpha = .93-.96$).

Obsessive Beliefs Questionnaire (OBQ; Obsessive compulsive cognitions working group [OCCWG], 2005)

The OBQ is a 44-item self-report instrument that measures dysfunctional beliefs (i.e., obsessive beliefs) hypothesized to underlie OCD symptoms. It contains three subscales: (a) threat overestimation and responsibility (OBQ-RT), (b) importance and control of thoughts (OBQ-ICT), and (c) perfectionism and need for

Table 1

Means and standard deviations on study measures.

Measure	Mean (SD)
DOCS total score	30.88 (14.23)
Contamination	6.91 (6.51)
Responsibility for Harm	7.94 (5.75)
Unacceptable Thoughts	9.75 (6.02)
Symmetry	6.15 (5.26)
OBQ-RT	64.41 (24.64)
OBQ-ICT	40.15 (18.36)
OBQ-PC	69.05 (23.43)
BDI-II	25.19 (12.84)

Note. DOCS = Dimensional Obsessive Compulsive Scale; OBQ = Obsessive Believe Questionnaire; RT = Responsibility/threat overestimation subscale; ICT = Importance/control of thoughts subscale; PC = Perfectionism/certainty subscale; BDI-II = Beck Depression Inventory-II.

certainty (OBQ-PC). The instrument has good validity, internal consistency, and test–retest reliability (OCCWG, 2005). Reliability of the OBQ subscales in the present sample were good ($\alpha = .92-.94$).

Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)

The BDI-II is a revised version of the original BDI (Beck et al., 1961)—a self-report scale that assesses the severity of affective, cognitive, motivational, vegetative, and psychomotor components of depression. Scores of 10 or less are considered normal; scores of 20 or greater suggest the presence of clinical depression. The BDI-II has excellent reliability and validity as a measure of general distress, and is widely used in clinical research (Beck et al., 1996). It is strongly correlated with measures of anxiety (e.g., $r = .73$ with trait anxiety; Fydrich, Dowdall, & Chambless, 1992) and thus was used as a measure of general negative affectivity in the present study. Reliability in the present sample was acceptable ($\alpha = .87$).

Data analytic strategy

We combined data from the three study sites to increase power as well as the generalizability of our findings.¹ Correlation coefficients were first computed to examine zero-order relationships between the DOCS subscales and the OBQ subscales, as well as depressive symptoms (BDI-II). Hypotheses regarding the prediction of OCD symptoms from obsessive beliefs were tested via a series of regression analyses with each DOCS subscale as the dependent variable. For each regression, the BDI-II was entered in the first step to control for general negative affectivity, and the OBQ subscales were entered simultaneously in the second step. We evaluated the individual beta coefficients of each predictor to determine which variables were significant predictors in the context of the other variables.

Results

Clinical characteristics

Table 1 displays the group means and standard deviations for the study measures, all of which fell within the clinical range and were similar to those reported for other groups of OCD patients. None of the three OBQ subscales were significantly correlated with

¹ Comparisons on clinical variables across the three study sites revealed significant differences ($p < .05$) on three study measures: the DOCS Responsibility for harm subscale, the OBQ-RT subscale, and the BDI-II. The general pattern of results held when we analyzed the UNC and Rogers Hospital data separately (the small sample size [$n = 11$] precluded such analyses for the Kansas City site). Therefore, we report results from the combined sample.

Table 2
Zero-order correlations between DOCS subscales and other study measures.

Measure	DOCS subscale			
	Contamination	Responsibility for harm	Unacceptable thoughts	Symmetry
OBQ-RT	.29**	.62**	.21*	.18*
OBQ-ICT	.08	.31**	.45**	.10
OBQ-PC	.10	.32**	.17	.43**
BDI-II	.05	.32**	.27**	.26**

DOCS = Dimensional Obsessive Compulsive Scale; OBQ = Obsessive Believe Questionnaire; RT = Responsibility/threat overestimation subscale; ICT = Importance/control of thoughts subscale; PC = Perfectionism/certainty subscale; BDI-II = Beck Depression Inventory-II.

* $p < .05$.
** $p < .01$.

age (range in r 's = $-.06$ to $-.1$, all p 's $> .05$) and there were no sex differences on any study variable.

Zero-order correlations

Table 2 presents the zero-order correlations between each of the DOCS subscales and the other study measures. As can be seen, DOCS contamination scores were weakly but significantly correlated with the OBQ-RT subscale, but were not significantly associated with the other OBQ domains or with BDI-II scores. Scores on the DOCS responsibility for harm subscale were significantly correlated with all of the study measures; and tests of significant differences among correlation magnitudes (e.g., Cohen & Cohen, 1983) indicated that symptoms pertaining to being responsible for harm were most strongly associated with the OBQ-RT subscale (p 's $< .01$). The DOCS unacceptable thoughts subscale was weakly but significantly correlated with BDI-II and OBQ-RT scores, and moderately correlated with the OBQ-ICT subscale. Comparisons of the correlation magnitudes revealed that the DOCS unacceptable thoughts subscale was more strongly related to the OBQ-ICT than to the OBQ-RT subscale ($p < .01$), but not the BDI-II. Finally, DOCS symmetry scores were weakly but significantly correlated with OBQ-RT and BDI-II scores, and moderately correlated with the OBQ-PC domain. Comparisons of correlation magnitude indicated that the relationship between symmetry and OBQ-PC was significantly stronger than that with the OBQ-RT ($p < .01$), but not the BDI-II.

Regression analyses

Results of the regression analyses predicting each DOCS subscale are presented next. Summary statistics for each variable in the final (second) step of each regression equation are presented in Table 3.

Contamination

In the first step of the regression analysis predicting DOCS contamination scores, the BDI-II explained a very small and nonsignificant amount of variance ($R^2 = .001$, $p > .05$). In Step 2, adding the OBQ subscales significantly increased the variance accounted for (R^2 change = $.11$, $p = .01$) so that the variance explained by the final model was statistically significant ($R^2 = .11$, $p < .01$). The OBQ-RT subscale emerged as the only significant predictor.

Responsibility for harm and mistakes

In Step 1, the BDI-II explained a significant portion of the variance in this DOCS subscale ($R^2 = .09$, $p = .001$). In Step 2 adding the OBQ subscales explained significant additional variance (R^2 change = $.33$, $p < .001$). The final model accounted for 42% of the variance in DOCS responsibility for harm subscale scores, which

Table 3
Summary statistics for the final step of regression equations predicting DOCS subscales.

Variable	R^2	Beta	t	P
<i>Predicting DOCS Contamination</i>				
Final model	.11			= .01
BDI-II		-.03	-.28	n.s.
OBQ-RT		.43	3.53	= .001
OBQ-ICT		-.08	-.68	n.s.
OBQ-PC		-.16	-1.30	n.s.
<i>Predicting DOCS Responsibility for Harm</i>				
Final model	.42			<.001
BDI-II		.21	2.81	<.01
OBQ-RT		.68	6.97	<.001
OBQ-ICT		-.04	-.48	n.s.
OBQ-PC		-.14	-1.46	n.s.
<i>Predicting DOCS Unacceptable Thoughts</i>				
Final model	.24			<.001
BDI-II		.16	1.86	n.s.
OBQ-RT		.04	.35	n.s.
OBQ-ICT		.45	4.37	<.001
OBQ-PC		-.11	-1.05	n.s.
<i>Predicting DOCS Symmetry</i>				
Final model	.21			<.001
BDI-II		.18	2.07	<.05
OBQ-RT		-.06	-.51	n.s.
OBQ-ICT		-.11	-1.10	n.s.
OBQ-PC		.45	4.06	<.001

DOCS = Dimensional Obsessive Compulsive Scale; BDI-II = Beck Depression Inventory-II; OBQ = Obsessive Believe Questionnaire; RT = Responsibility/threat overestimation subscale; ICT = Importance/control of thoughts subscale; PC = Perfectionism/certainty subscale.

was significant ($R^2 = .42$, $p < .001$). In the final model, both the BDI-II and OBQ-RT subscale were significant predictors.

Unacceptable thoughts

In Step 1, the BDI-II explained a small but significant portion of the variance in DOCS unacceptable thoughts scores ($R^2 = .07$, $p < .01$). In Step 2, adding the OBQ subscales accounted for significant additional variance ($R^2 = .17$, $p < .001$). The final model accounted for a significant portion of the variance in DOCS unacceptable thoughts scores ($R^2 = .24$, $p < .001$), with the OBQ-ICT subscale emerging as the only significant predictor.

Symmetry

In Step 1, the BDI-II explained a significant portion of the variance in symmetry scores ($R^2 = .07$, $p < .01$). Including the OBQ subscales in Step 2 explained significant additional variance (R^2 change = $.14$, $p < .001$). The final model accounted for a significant portion of the variance in unacceptable thoughts ($R^2 = .21$, $p < .001$), with both the BDI-II and OBQ-PC subscale emerging as significant predictors.

Discussion

Using a new dimensional measure of OCD symptoms, the present study aimed to shed further light on the relationships between OCD symptom dimensions and dysfunctional (obsessive) beliefs—an area of research with mixed results. The present findings, however, are consistent with our hypotheses which were derived from focused models of the OCD symptom dimensions (e.g., Rachman, 1997, 2002, 2004; Summerfeldt, 2008). That is, each OCD symptom dimension was predicted by one or more domains obsessive beliefs, and the three cognitive domains measured by the OBQ evidenced conceptually consistent associations with particular OCD symptom dimensions. Moreover, these relationships were present even after controlling for general negative affect.

The key findings of our study can be summarized as follows: Beliefs pertaining to inflated responsibility and overestimates of the likelihood of threat were predictive of the contamination OCD dimension, which involves obsessions about dirt, germs, and sicknesses, along with primarily washing and cleaning rituals. Inflated responsibility and overestimates of threat also predicted the OCD symptom dimension primarily involving obsessional guilt and doubt about being responsible for causing (or failing to prevent) harm and mistakes, along with excessive checking and re-assurance-seeking rituals. Beliefs pertaining to the need for certainty and perfection predicted symmetry and ordering OCD symptoms, which involve obsessional thoughts regarding things being “incomplete” or “not just right,” along with ordering and arranging rituals. Finally, beliefs about the importance of and need to control thoughts predicted the unacceptable thoughts dimension of OCD, which involves religious, sexual, and violent obsessions along with neutralizing strategies (e.g., mental rituals, repeating simplistic behaviors) aimed at preventing negative outcomes or trying to dismiss the thought altogether. The fact that obsessive beliefs predicted OCD symptom dimensions even after accounting for general negative affectivity suggests that these associations are at least somewhat specific to OCD symptoms, as opposed to psychological distress in general.

Whereas previous studies investigating relationships between OCD symptoms and related cognitive phenomena have not found results consistent with conceptual models of OCD symptom dimensions, the present findings are in line with these conceptual models. Perhaps these relationships have been obscured in previous studies because the cognitive variables were being used to predict individual OCD symptoms (e.g., checking rituals, aggressive obsessions), as opposed to predicting empirically supported symptom dimensions (e.g., contamination, responsibility for harm). To this end, the present findings support the use of the DOCS as a conceptually valid measure of the dimensional structure of OCD symptoms.

Our results show that all four OCD symptom dimensions were significantly predicted by obsessive beliefs above and beyond general negative affectivity. Of note, however, the contribution of obsessive beliefs, in terms of the total variance predicted, varied across the symptom dimensions. Whereas the OBQ domains together accounted for a third of the variance in responsibility for harm symptoms, only 11% of the variability in contamination scores was explained after accounting for BDI-II scores. Thus, although significant variance in OCD symptom dimensions was explained by the OBQ subscales, substantial unexplained variance remained, indicating that additional factors are involved in the various symptom dimensions of OCD.

In the case of the contamination dimension, which was least explained by the OBQ subscales, researchers have proposed that cognitions specific to the likelihood and severity of becoming contaminated may underlie symptoms (e.g., Deacon, 2009). The propensity to experience disgust also appears to play a role in contamination-related OCD symptoms (Olatunji, Sawchuck, Lohr, & de Jong, 2004), and may be associated with the general perception of threat and inflated responsibility. For example, Cisler et al. (in press) found a significant interaction between OBQ-RT and disgust propensity in predicting contamination symptoms, which suggests that overestimation of threat and personal responsibility potentiates the relationship between disgust and contamination fear.

These findings with contamination concerns highlight an important limitation of the present study: our use of the OBQ as the sole measure of cognitions. Whereas the OBQ measures a set of dysfunctional beliefs supported by both theory and empirical research as being related to OCD symptoms, it is most likely not an exhaustive measure of the cognitive phenomena involved in OCD. Other potentially predictive constructs have been proposed,

including disgust sensitivity (Olatunji et al., 2004), “not just right” experiences (Coles, Frost, Heimberg, & Rheume, 2003), experiential avoidance (Eifert & Forsyth, 2005), and contamination specific cognitions (Deacon, 2009). Future studies should investigate the relationship between OCD symptom dimensions and measures of these constructs, and should consider the possibility of interactions among these factors and the other obsessive beliefs.

Our findings have implications for cognitive-behavioral theoretical perspectives on OCD. That the four OCD symptom dimensions could be explained by the domains of obsessive beliefs as measured by the OBQ provides general support for a broad conceptual model of OCD. However, research on the dimensional structure of OCD symptoms, along with the fact in our study that each symptom dimension was uniquely predicted by only a single belief domain, suggests that it may be most useful to understand OCD at the level of these thematically and cognitively homogeneous symptom dimensions. From this perspective, theoretical and empirical work focusing on specific OCD symptom dimensions will provide greater contributions to the literature than will focusing on the “disorder” itself.

Another reason for understanding OCD at the level of symptom dimensions is to foster the development of more efficient and effective interventions. To this end, our findings have clinical implications as the beliefs linked with each symptom dimension, and hypothesized to underlie the development and maintenance of the symptoms, can be targeted in treatment through either cognitive restructuring or exposure therapy (e.g., Abramowitz, 2006; Clark, 2004; Wilhelm & Steketee, 2006). For example, when treating individuals with contamination symptoms, it might be most beneficial to address overestimates of the threat and inflated estimates of responsibility, especially when the patient is obsessed with contaminating others. In treating patients whose primary concerns are unacceptable sexual or religious obsessions, clinicians might focus on correcting erroneous beliefs about the meaning of and need to control intrusive thoughts. Likewise, therapists treating OCD patients with presenting concerns focused on the need for symmetry and exactness might address cognitions about the need for perfection, while those treating patients whose presenting concerns involve obsessional doubts that they have caused harm may wish to target beliefs pertaining to an inflated sense of personal responsibility for causing or preventing harm. Treatment outcome research is needed to determine whether targeting specific beliefs in such a way would lead to improved treatment efficacy.

Additional limitations of the present study should be considered as well. First, our use of a cross-sectional design precludes drawing causal inferences. Similarly, the correlational nature of the study limits the conclusions that can be drawn. While previous longitudinal studies suggest that the dysfunctional beliefs we measured do in fact play a role in the pathogenesis of OCD symptoms (e.g., Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006, 2007), the present study cannot rule out that beliefs follow the appearance of symptoms, or that both symptoms and beliefs are caused by one or more third variables. Another limitation of this study is that all data were collected using self-report methods, which may artificially inflate relationships among variables. The development of “on line” (in vivo) behavioral measures of OCD symptom dimensions and related cognitive distortions would greatly aid the future study of the relationships between these phenomena.

References

- Abramowitz, J. S. (2006). *Understanding and treating obsessive-compulsive disorder: A cognitive-behavioral approach*. Mahway NJ: Lawrence Erlbaum.
- Abramowitz, J. S., & Deacon, B. J. (2006). Psychometric properties and construct validity of the obsessive-compulsive inventory-revised: replication and extension with a clinical sample. *Journal of Anxiety Disorders*, 20, 1016–1035.

- Abramowitz, J. S., Deacon, B., Olatunji, B. O., Wheaton, M. G., Berman, N. C., Losardo, D. L., et al. (2010). Assessment of obsessive-compulsive symptoms: development and evaluation of the dimensional obsessive-compulsive scale. *Psychological Assessment*, 22, 180–198.
- Abramowitz, J. S., Khandker, M., Nelson, C., Deacon, B., & Rygwall, R. (2006). The role of cognitive factors in the pathogenesis of obsessions and compulsions: a prospective study. *Behaviour Research and Therapy*, 44, 1361–1374.
- Abramowitz, J. S., Nelson, C. A., Rygwall, & Khandker, M. (2007). The cognitive mediation of obsessive-compulsive symptoms: a longitudinal study. *Journal of Anxiety Disorders*, 21, 91–104.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Beck, A. T. (1976). *Cognitive therapy of the emotional disorders*. New York: International Universities Press.
- Beck, A. T., Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561–571.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck depression inventory manual* (2nd ed.). San Antonio, TX: Psychological Corporation.
- Burns, G., Keortge, S., Formea, G., & Sternberger, L. (1996). Revision of the Padua inventory of obsessive compulsive disorder symptoms: distinctions between worry, obsessions, and compulsions. *Behaviour Research and Therapy*, 34, 163–173.
- Calamari, J. E., Cohen, R. J., Rector, N. A., Szacun-Shimizu, K., Reimann, B. C., & Norberg, M. M. (2006). Dysfunctional belief-based obsessive-compulsive disorder subgroups. *Behaviour Research and Therapy*, 44, 1347–1360.
- Cisler, J. M., Brady, R. E., Olatunji, B. O., & Lohr, J. M. Disgust and obsessive beliefs in contamination-related OCD. *Cognitive Therapy Research*, in press.
- Clark, D. A. (2004). *Cognitive-behavioral therapy for OCD*. New York: Guilford.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression and correlational analysis for the behavioral sciences*. Hillsdale, NJ: L. Erlbaum Associates.
- Coles, M. E., Frost, R. O., Heimberg, R. G., & Rheume, J. (2003). "Not just right experiences": perfectionism, obsessive-compulsive features and general psychopathology. *Behaviour Research and Therapy*, 41, 681–700.
- Deacon, B. (2009). Measuring threat overestimation in contamination fear: the contamination cognitions scale. In J. Cisler (Ed.), *Cognitive processes in contamination-related OCD: New insights from emerging research. Paper presented at the 42nd annual convention of the association for behavioral and cognitive therapies*. New York, NY.
- Deacon, B. J., & Abramowitz, J. S. (2005). The Yale-Brown obsessive compulsive scale: factor analysis, construct validity, and suggestions for refinement. *Journal of Anxiety Disorders*, 19, 573–585.
- Di Nardo, Brown, T., & Barlow, D. H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV: Lifetime Version (ADIS-IV-LV)*. San Antonio, TX: The Psychological Corporation.
- Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance and commitment therapy for anxiety disorders: A practitioner's guide to using mindfulness, acceptance, and values-based behavior change strategies*. Oakland: New Harbinger.
- Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., et al. (2002). The obsessive-compulsive inventory: development and validation of a short version. *Psychological Assessment*, 14, 485–496.
- Foa, E. B., & Kozak, M. J. (1995). DSM-IV field trial: obsessive-compulsive disorder. *American Journal of Psychiatry*, 152, 90–96.
- Frost, R. O., & Steketee, S. (2002). *Cognitive approaches to obsessions and compulsions: Theory, assessment, and treatment*. Oxford: Elsevier.
- Fydrich, T., Dowdall, D., & Chambless, D. (1992). Reliability and validity of the beck anxiety inventory. *Journal of Anxiety Disorders*, 6, 55–61.
- Jones, M. K., & Menzies, R. G. (1997). The cognitive mediation of obsessive-compulsive handwashing. *Behaviour Research and Therapy*, 35, 843–850.
- Julien, D., O'Connor, K. P., Aardema, F., & Todorov, C. (2006). The specificity of belief domains in obsessive-compulsive disorder. *Personality and Individual Differences*, 41, 1205–1216.
- McKay, D., Abramowitz, J. S., Calamari, J. E., Kyrios, M., Radomsky, A. S., Sookman, D., et al. (2004). A critical evaluation of obsessive-compulsive disorder subtypes: symptoms versus mechanisms. *Clinical Psychology Review*, 24, 283–313.
- Mataix-Cols, D., Rosario-Campos, M. C., & Leckman, J. F. (2005). A multidimensional model of obsessive-compulsive disorder. *American Journal of Psychiatry*, 162, 228–238.
- Myers, S. G., Fisher, P. L., & Wells, A. (2008). Belief domains of the Obsessive Beliefs Questionnaire-44 (OBQ-44) and their specific relationship with obsessive-compulsive symptoms. *Journal of Anxiety Disorders*, 22, 475–484.
- Obsessive Compulsive Cognitions Working Group. (2001). Development and initial validation of the obsessive beliefs questionnaire and the interpretations of intrusions inventory. *Behaviour Research and Therapy*, 39, 987–1006.
- Obsessive Compulsive Cognitions Working Group. (2005). Psychometric validation of the obsessive belief questionnaire and interpretation of intrusions inventory: part 2, factor analyses and testing of a brief version. *Behaviour Research and Therapy*, 43, 1527–1543.
- Olatunji, B. O., Sawchuck, C. N., Lohr, J. M., & de Jong, P. J. (2004). Disgust domains in the prediction of contamination fear. *Behaviour Research and Therapy*, 42, 93–104.
- Purdon, C. (2008). Unacceptable obsessional thoughts and covert rituals. In J. S. Abramowitz, D. McKay, & S. Taylor (Eds.), *Clinical handbook of obsessive-compulsive disorder and related problems* (pp. 61–75). Baltimore: Johns Hopkins University Press.
- Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy*, 35, 793–802.
- Rachman, S. (2002). A cognitive theory of compulsive checking. *Behaviour Research and Therapy*, 40, 625–639.
- Rachman, S. (2004). Fear of contamination. *Behaviour Research and Therapy*, 42, 1227–1255.
- Salkovskis, P. M. (1985). Obsessional-compulsive problems: a cognitive-behavioral analysis. *Behaviour Research and Therapy*, 23, 571–583.
- Sheehan, D., Lecrubier, Y., Harnett-Sheehan, K., Amoriam, P., Janavs, J., Weiller, E., et al. (1998). The Mini International neuropsychiatric interview (M.I.N.I.): the development and validation of a structured diagnostic interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, 59(Suppl. 20), 22–33.
- Summerfeldt, L. J. (2008). Ordering, incompleteness and arranging. In J. S. Abramowitz, D. McKay, & S. Taylor (Eds.), *Clinical handbook of obsessive-compulsive disorder and related problems* (pp. 44–60). Baltimore: Johns Hopkins University Press.
- Taylor, S., Abramowitz, J. S., McKay, D., Calamari, J. E., Sookman, D., Kyrios, M., et al. (2006). Do dysfunctional beliefs play a role in all subtypes of obsessive-compulsive disorder? *Journal of Anxiety Disorders*, 20, 85–97.
- Tolin, D. F., Brady, R. E., & Hannan, S. E. (2008). Obsessional beliefs and symptoms of obsessive-compulsive disorder in a clinical sample. *Journal of Psychopathology and Behavioral Assessment*, 30, 31–42.
- Tolin, D. F., Woods, C. M., & Abramowitz, J. S. (2003). Relationship between obsessional beliefs and obsessive-compulsive symptoms. *Cognitive Therapy and Research*, 27, 657–669.
- Tolin, D. F., Worhunsky, P., & Maltby, N. (2006). Are "obsessive" beliefs specific to OCD?: a comparison across anxiety disorders. *Behaviour Research and Therapy*, 44, 469–480.
- Wilhelm, S., & Steketee, G. S. (2006). *Cognitive therapy for obsessive compulsive disorder: A guide for professionals*. Oakland, CA: New Harbinger.