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Obsessive beliefs, experiential avoidance, and cognitive fusion as predictors of obsessive-compulsive disorder symptom dimensions

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ABSTRACT

Cognitive models of obsessive-compulsive disorder (OCD), although widely-supported, do not fully explain obsessive-compulsive (OC) symptoms. Mid-level constructs from acceptance and commitment therapy (ACT; e.g., experiential avoidance, cognitive fusion) may advance our understanding of OCD symptoms by adding explanatory power to existing conceptual models. The current study examined the extent to which mid-level ACT constructs account for unique variability in OCD symptom dimensions within a large treatment-seeking sample of individuals with OCD. In line with previous research in analogue samples, regression analyses revealed that although experiential avoidance and cognitive fusion showed associations with OCD symptoms, these constructs did not generally add to the prediction of OCD symptoms once general distress and obsessive beliefs were accounted for. An exception was that cognitive fusion was a unique predictor of unacceptable obsessional thoughts along with beliefs about importance of and need to control thoughts. These findings provide further support for the cognitive model of OCD as well as the notion that mid-level ACT constructs best relates to the unacceptable thoughts dimension of OCD. Conceptual and treatment implications, study limitations, and future directions are discussed.

1. Introduction

Obsessive-compulsive disorder (OCD) is a prevalent, debilitating condition marked by intrusive thoughts that provoke distress (i.e., obsessions) and ritualistic behaviors (e.g., compulsive rituals) performed with the aim of reducing said distress (American Psychiatric Association, 2013). Left untreated, it runs a chronically worsening course that exacts substantial morbidity (Steketee, 1997). Further, OCD is heterogeneous, with the dimensions of obsessions and compulsions varying from person to person and within individuals. Because this heterogeneity has implications for the assessment and treatment of OCD, a fine-grained understanding of the presentation of this complex condition is necessary.

Structural analyses of OCD symptoms indicate the presence of symptom dimensions composed of both obsessions and compulsions (e.g., Mataix-Cols, do Rosario-Campos, & Leckman, 2005; McKay et al., 2004). Four such dimensions include (a) obsessions about contamination with washing/cleaning compulsions; (b) obsessions about responsibility for causing harm or making mistakes with checking compulsions; (c) obsessions involving feeling incomplete or "not just right" with ordering and arranging compulsions; and (d) unacceptable thoughts about sex, religion, and violence along with mental rituals and other covert neutralizing strategies (e.g., thought replacement). Importantly, individuals with OCD often endorse obsessions and compulsions pertaining to multiple dimensions.

A number of conceptual models have been proposed in an attempt to understand the complexity and heterogeneity of OCD. To date, the cognitive (cognitive-behavioral) model is the most empirically supported conceptual approach (e.g., Salkovskis, 1996). According to this perspective, obsessions arise from maladaptive dysfunctional beliefs such as the tendency to overestimate threat and responsibility, beliefs about the importance of and need to control thoughts, and beliefs about the need for certainty and perfection. Such obsessive beliefs lead to the misinterpretation of normal, universally occurring intrusive thoughts and other low-risk situations and stimuli as highly threatening (e.g., "thinking of harming a baby could increase the likelihood of committing said harm"), which leads to obsessional fear and urges to perform anxiety-reduction behaviors such as escape behaviors, thought suppression, and compulsive rituals. Such anxiety-reduction behaviors, however, paradoxically maintain the problem by preventing the natural self-correction of obsessive beliefs and misappraisals, the result being a self-perpetuating vicious cycle.

Various theorists have developed cognitive-behavioral "mini-models" to explain particular OCD symptom dimensions. For the most

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part, differences among these models focus on the types or combinations of obsessive beliefs proposed to be involved in the escalation of intrusive thoughts into obsessions. As examples, contamination concerns are thought to arise from overestimates of threat from germs and disease (Rachman, 2004), whereas symmetry concerns are thought to arise from overly rigid beliefs about the need for completeness, perfection, and intolerability of "not just right" experiences (Summerfeldt, 2004). Unacceptable obsessions are thought to arise from beliefs that negative thoughts are personally or morally significant (i.e., equivalent to actions) and that one can and should control such thoughts (Rachman, 1997, 1998). Finally, harm obsessions and checking compulsions are thought to arise from overestimates of responsibility for causing or preventing harm (e.g., Salkovskis, 1996). Despite these mini-models, there are overlaps in symptom dimensions. For example, checking compulsions may be observed in people with obsessions that are not harm-related.

Despite strong empirical support from correlational, experimental, and longitudinal research (e.g., Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2006), as well as the efficacy of interventions based on cognitive-behavioral conceptualizations of OCD (e.g., exposure and response prevention, cognitive therapy; Abramowitz & Jacoby, 2014), research shows that cognitive constructs do not entirely account for OCD symptoms in statistical models (e.g., Taylor et al., 2006; Martinelli, Chasson, Wetterneck, Hart, & Björgvinsson, 2014, Gwilliam, Wells, & Cartwright-Hatton, 2004). Accordingly, it is worthwhile considering additional frameworks that might improve the explanatory power of existing conceptual models. One such framework is Acceptance and Commitment Therapy (ACT). ACT is an experiential, contextual approach to psychotherapy that targets psychological inflexibility through the use of six core processes of change. It is based on the basic science of behavior analysis including a modern behavioral approach to language and cognition called Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001). ACT is grounded in the philosophy of science known as functional contextualism.

Two mid-level ACT constructs thought to be related to OCD are *experiential avoidance* and *cognitive fusion*. Experiential avoidance (EA) refers to attempts to control or avoid unwanted internal experiences such as emotions (e.g., anxiety). Cognitive fusion, which is thought to maintain EA (Hayes, Luoma, Bond, Masuda, & Lillis, 2006), is the tendency to take such internal experiences (e.g., thoughts) as literal facts, rather than viewing them simply as private events. Acceptance and Commitment Therapy (ACT) was derived aims to help individuals with OCD to promote "psychological flexibility" and practice acceptance of obsessions and the associated feelings of anxiety and fear (i.e., by considering these experiences as passing words and sensations, and choosing to give them less weight). A growing literature supports the relationship between mid-level ACT constructs and OCD symptoms as well as the efficacy of ACT in the treatment of OCD (see Bluett, Homan, Morrison, Levin, & Twohig, 2014 for a review).

Can EA and cognitive fusion add to the explanatory value of cognitive models (i.e., obsessive beliefs) of the various OCD symptom dimensions? To date, little research has addressed this conceptually significant question. Abramowitz, Lackey, and Wheaton (2009) examined the individual and relative contributions of EA and obsessive beliefs as predictors of OC symptoms in a non-clinical sample. 353 undergraduate students completed a battery of online questionnaires designed to assess OC symptom severity, obsessive beliefs, and EA. The researchers found that individuals reporting greater levels of OC symptoms endorsed more obsessive beliefs and EA relative to those with lower levels of OC symptoms, even when accounting for general psychological distress. EA, however, did not add significantly to the prediction of OC symptom dimensions over and above the contribution of general distress and obsessive beliefs. In contrast, obsessive beliefs, contributed significantly to the prediction of OC symptoms after accounting for EA. Manos and colleagues (2010) replicated these findings in a treatment-seeking sample of 108 patients with OCD who completed a packet of questionnaires upon admission to a residential treatment facility. The researchers also reported that obsessive beliefs, but not EA, added significantly to the prediction of OCD symptom dimensions above and beyond depression and general anxiety.

Cognitive fusion has similarly received little empirical examination with regard to OCD. In one study using a non-clinical sample of 278 undergraduate students, Reuman, Jacoby, and Abramowitz (2016) found that cognitive fusion was correlated with OC symptoms, and that together with EA, it added to the prediction of the unacceptable thoughts OC symptom dimension above and beyond obsessive beliefs. EA, but not cognitive fusion, however, predicted the responsibility dimension. Reuman, Buchholz, Blakey, and Abramowitz (2017) expanded upon these findings by testing a more comprehensive battery of OCD-relevant cognitive constructs, including intolerance of uncertainty (IU) and thought action fusion (TAF). Although IU and TAF were significant predictors across OC symptom dimensions in their non-clinical sample, cognitive fusion was only a unique predictor of the unacceptable thoughts symptom dimension. While results from these studies suggest that cognitive fusion best relates to the unacceptable thoughts dimension of OCD, no studies have examined this question in a clinically severe (patient) sample, preventing stronger conclusions.

Accordingly, the current study had two aims. Our first aim was to examine two mid-level ACT constructs (EA and cognitive fusion) as predictors of OCD symptom dimensions in a large sample of individuals with a diagnosis of OCD. On the basis of the aforementioned analogue research, we hypothesized that these two ACT constructs would predict all but the contamination OCD symptom dimensions. Our second aim was then to examine the relative contributions of obsessive beliefs, EA, and cognitive fusion in the prediction of the various OCD symptom dimensions; specifically to test whether after accounting for obsessive beliefs, the mid-level ACT constructs add explanatory value. On the basis of previous research we hypothesized that obsessive beliefs would differentially predict all OCD symptom dimensions even after accounting for general distress/depressive symptoms. Moreover, given that cognitive fusion relates to ascribing meaning to internal experiences such as unwanted thoughts and that the unacceptable thoughts dimension is characterized by unwanted internal events (i.e., intrusive thoughts) rather than external stimuli (e.g., contaminated objects), we predicted that cognitive fusion would emerge as a significant, unique predictor (above and beyond obsessive beliefs) of the unacceptable thoughts symptom dimension, but not the other three dimensions. Finally, we predicted that EA would not contribute additional unique variance in the prediction of OCD symptom dimensions, replicating previous studies.

2. Material and methods

2.1. Participants

Participants in the current study were 92 individuals recruited from an outpatient psychotherapy clinic specializing in the treatment of OCD and anxiety disorders. All had been given a primary diagnosis of OCD following a semi-structured clinical interview guided by the Yale-Brown Obsessive Compulsive Symptom (YBOCS; Goodman et al., 1989) Checklist. Patients were excluded from the study if they evidenced comorbid psychotic symptoms or current substance abuse.

The sample included 44 women (48%), had a mean age of 30.62 years (SD = 11.63; range = 15 − 65 (n = 80; 87%) identified as White/European American, with 1.1% (n = 1) identifying as Asian and 1.1% (n = 1) identifying as African American. Three (3.3%) participants self-identified as being of Hispanic origin and three (3.3%) as Native American. Four participants (4.3%) did not self-disclose their race/ethnicity. Most participants (n = 42; 45.7%) were single; 38% (n = 35) were married.

2.2. Procedure

Prior to their initial visit to the clinic, all participants completed a battery of self-report questionnaires of OCD symptoms, general distress (anxiety and depression), and related clinical and theoretical constructs which included the measures described below. The director of the clinic (JSA) reviewed the results of these assessments and conducted the YBOCS interview. As part of the intake process, participants provided consent to allow their responses to be used for both clinical and research purposes. Prior to data entry and analytics, all intake packets were de-identified (i.e., all protected health information) was removed.

The following questionnaires were completed as part of the study.

Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014). The CFQ is a 7-item self-report instrument designed to measure excessive attachment to the literal content of thoughts (i.e., cognitive fusion). Items (e.g., "I tend to get very entangled in my thoughts") assess literality, engagement with thoughts, entanglement, and struggle and are rated on a scale from 1 ("*Never true*") to 7 ("*Always true*"), with higher scores indicating greater fusion with thoughts. Reported mean total scores for a student/community convenience sample and a mixed mental health sample were 22.28 and 34.31, respectively (Gillanders et al., 2014). The measure correlates highly in predicted directions with related ACT constructs such as EA, mindfulness, and consistency of living important values. It demonstrates excellent internal consistency and can distinguish between healthy individuals and people with psychological disorders (Gillanders et al., 2014). In the present sample, the CFQ had good reliability (α = .89).

Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). This 7-item unidimensional scale assesses EA, which is a core construct within the ACT model of psychopathology (Hayes et al., 2006). Individual items (e.g., "I am in control of my life") are rated from 1 ("*Never true*") to 7 ("*Always true*") and higher scores indicate less pathology. Preliminary evidence suggests that AAQ-II total scores above the range of 24–28 may indicate a clinically relevant level of distress (Bond et al., 2011). The AAQ-II has been shown to have good psychometric properties and good convergent, discriminant, and incremental validity. In the present sample, the AAQ showed good reliability (α = .81).

Obsessive Beliefs Questionnaire (OBQ; Obsessive Compulsive Cognitions Working Group, 2005). The OBQ, a 44-item self-report instrument, measures dysfunctional ("obsessive") beliefs thought to contribute to the escalation of normal intrusive thoughts into clinical obsessions. It contains three subscales: (a) threat overestimation and responsibility (OBQ-T/R), (b) importance and control of intrusive thoughts (OBQ-I/CT), and (c) perfectionism and need for certainty (OBQ-P/C). Individual items (e.g., "Having bad thoughts means I am weird or abnormal") are rated from 1 ("*Disagree very much*") to 7 ("*Agree very much*"). The instrument's good validity, internal consistency, and test-retest reliability are described in OCCWG (2005). In the present sample, the OBQ (and its subscales) showed excellent reliability (αs = .94 − .95).

Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010). The DOCS is a 20-item self-report measure that assesses OCD symptom severity across the four most empirically supported symptom dimensions: germs and contamination, responsibility for harm, unacceptable thoughts, and symmetry/the need for things to be "just right." Within each dimension (subscale), five items are rated on a five point Likert scale to assess: time occupied by obsessions and compulsions, escape behaviors, associated distress, functional interference, and difficulty disregarding the obsessions and refraining from the compulsions over the past month. A sample item reads, "About how much time have you spent each day with unwanted unpleasant thoughts and with behavioral or mental actions to deal with them?" Higher total scores indicate greater OCD symptom severity; the normative total score among individuals with OCD is 30.06 in comparison to an average total score of 11.93 in a nonclinical student population. A cutoff score of 18 provides the best balance between sensitivity and specificity in classifying OCD patients from nonclinical adults (Abramowitz et al., 2010).

The DOCS subscales have good to excellent reliability in both clinical and undergraduate samples (α = .83 − .96), and test-retest reliability analyses indicate adequate stability of test scores. The measure converges well with other measures of OCD symptoms and discriminates from general measures of depression, anxiety, stress, and social anxiety in patients and students. Reliability of the DOCS subscales in the present sample was excellent (αs = .94 − .96).

Beck Depression Inventory (BDI-II; Beck, Epstein, Brown, & Steer, 1988). The BDI-II is a 21-item self-report scale that assesses the severity of depressive symptoms experienced during the past week. Respondents rate items related to depressive symptoms (e.g., sadness, fatigue) on a Likert scale ranging from 0 to 3. Total scores range from 0 to 63, and higher scores indicate greater depressive symptomatology. Recommended cut-offs for BDI-II total scores are as follows: 0–13 is considered minimal range, 14–19 indicates mild depressive symptoms, 20–28 indicates moderate depressive symptoms, and 29–63 indicates severe depressive symptoms. Reliability of the BDI-II in the present sample was good (α = .86).

2.3. Data analytic plan

Our approach to data analysis included the following steps: first, we computed descriptive statistics for all study variables. Second, we computed a series of two-tailed zero-order correlations to examine associations among the AAQ-II, BDI-II, CFQ, OBQ subscales, and DOCS subscales. Third, to examine the contributions of select mid-level ACT constructs alone in predicting OCD symptom dimensions, we computed regression equations using the CFQ and AAQ-II to predict each of the four DOCS subscales. Finally, to examine the unique and combined contributions of obsessive beliefs and ACT constructs, we computed four hierarchical regression analyses (one for each DOCS subscale as the dependent variable) entering the BDI-II in step 1, the OBQ subscales in step 2, and the CFQ and AAQ-II jointly in step 3.

3. Results

3.1. Group mean scores and correlations

Table 1 presents the means, standard deviations, skewness, and kurtosis for all study measures. As would be expected in a treatment-seeking sample, scores on the DOCS and OBQ indicated moderate to severe levels of OCD symptoms and obsessive beliefs (e.g., Jacoby, Fabricant, Leonard, Riemann, & Abramowitz, 2013). Mean scores on the BDI-II indicated moderate depressive symptomatology. The

Table 1
Descriptive statistics for study measures.

Measure	Mean	*SD*	Skewness	Kurtosis
DOCS- Responsibility	8.17	6.11	0.17	− 1.25
DOCS- Symmetry	5.21	5.44	0.77	− 0.55
DOCS- Contamination	5.80	6.00	0.67	− 0.86
DOCS- Unacceptable Thoughts	11.01	5.96	− 0.60	− 0.90
CFQ	40.24	7.02	− 1.08	1.04
AAQ-II	34.04	8.06	− 0.39	− 0.40
BDI-II	18.74	9.53	0.49	0.64
OBQ - ICT	44.69	20.21	0.23	− 1.18
OBQ - RT	65.54	25.11	− 0.12	− 0.81
OBQ - PC	68.92	22.30	− 0.24	− 0.56

Note. DOCS = Dimensional Obsessive Compulsive Scale; CFQ = Cognitive Fusion Questionnaire; AAQ-II = Acceptance and Action Questionnaire; BDI-II = Beck Depression Inventory; OBQ = Obsessive Beliefs Questionnaire; ICT = Importance of Controlling Thoughts; RT = Responsibility/Threat; PC = Perfectionism/Certainty.

Table 2
Zero-order bivariate (Pearson) correlations.

	1	2	3	4	5	6	7	8	9
1. DOCS-Responsibility	–								
2. DOCS-Symmetry	.40*	–							
3. DOCS-Contamination	.27	.38*	–						
4. DOCS-Unacceptable Thoughts	.35	.04	− .13	–					
5. CFQ	.39*	.12	.09	.46*	–				
6. AAQ-II	.34	.26	.10	.33	.53*	–			
7. BDI-II	.22	.06	.21	.36	.51*	.54*	–		
8. OBQ - ICT	.29	.16	.02	.53*	.48*	.46*	.48*	–	
9. OBQ - RT	.59*	.24	.40*	.24	.35	.32	.30	.53*	–
10. OBQ - PC	.41*	.40*	.37*	.20	.39*	.45*	.32	.52*	.64*

Note. DOCS = Dimensional Obsessive Compulsive Scale; CFQ = Cognitive Fusion Questionnaire; AAQ-II = Acceptance and Action Questionnaire; BDI-II = Beck Depression Inventory; OBQ = Obsessive Beliefs Questionnaire; ICT = Importance of Controlling Thoughts; RT = Responsibility/Threat; PC = Perfectionism/Certainty.
* $p < 0.001$.

sample's mean score on the AAQ-II was greater than scores reported in previous outpatient samples (Bond et al., 2011), yet less than that in a sample of adults seeking residential treatment for OCD (Manos et al., 2010). Finally, the mean CFQ score was slightly higher than those reported in mixed mental health clinical samples (Gillanders et al., 2014).

Table 2 presents zero-order bivariate (Pearson) correlation coefficients among all study variables. As can be seen, the relationships among variables ranged from weak to strong (range of *r*s was .04–.59). We applied a Bonferroni corrected alpha of $p < .001$ (0.05/45), which indicated that the DOCS-responsibility and unacceptable thoughts subscales showed the most significant associations with the other study variables. Of the DOCS subscales, the unacceptable thoughts subscale was most strongly associated with the AAQ-II and CFQ. The BDI-II was also strongly correlated (0.51 – 0.54) with the ACT measures. Finally, the OBQ subscales also demonstrated strong correlations with one another.

3.2. ACT constructs predicting OCD symptom dimensions

The data structure met all statistical assumptions regarding linear regression models (i.e., multivariate normality, homoscedasticity, and linearity of the relationships between variables and the outcome). Moreover, in all of the regression models reported below, multicollinearity diagnostics were within the acceptable levels: variance inflation factors (VIF) were below 10, and tolerance values were greater than .10 (Cohen, Cohen, West, & Aiken, 2013).

Summary statistics for each simultaneous regression analysis using the AAQ-II and CFQ to predict the four DOCS subscales appear in Table 3. As can be seen, the overall models were significant for all of the DOCS subscales with the exception of the contamination subscale, for which the predictors accounted for only 1% of the variance, F (2,83) = 0.45, $p = 0.64$. For the responsibility subscale, the model accounted for 15.8% of the variance, F (2,83) = 7.60, $p = 0.001$, and the CFQ emerged as unique significant predictor. The model accounted for 20.5% of the variance in scores on the unacceptable thoughts subscale, F (2,82) = 10.30, $p < 0.001$, with the CFQ again emerging as a unique significant predictor. Finally, the model accounted for 7.3% of the variance in symmetry subscale scores, F (2,83) = 3.21, $p = 0.045$, and the AAQ-II emerged as unique significant predictor.

3.3. Obsessive beliefs and ACT constructs predicting OCD symptom dimensions

Summary statistics for the full model in each hierarchical regression analysis predicting the DOCS subscales appear in Table 4. The data structure again met all statistical assumptions regarding linear regression models.

Predicting DOCS-contamination. In Step 1, the BDI-II did not explain significant variance in DOCS-contamination scores ($R^2 = 0.04$,

Table 3
Summary statistics for AAQ-II and CFQ predicting DOCS subscales.

Variable	R^2	Beta	t	p	sr^2
Predicting DOCS-Contamination					
Full Model	.01			0.64	
CFQ		0.04	0.33	0.75	.001
AAQ-II		0.08	0.58	0.56	.004
Predicting DOCS-Responsibility					
Full Model	.16			0.001*	
CFQ		0.25	2.06	0.04*	.04
AAQ-II		0.21	1.71	0.09	.03
Predicting DOCS-Unacceptable Thoughts					
Full Model	.21			< .001*	
CFQ		0.37	3.10	0.003*	.01
AAQ-II		0.14	1.17	0.03*	.10
Predicting DOCS-Symmetry					
Full Model	.07			0.05*	
CFQ		− 0.08	− 0.62	0.54	.004
AAQ-II		0.31	2.41	0.02*	.07

Note. DOCS = Dimensional Obsessive Compulsive Scale; CFQ = Cognitive Fusion Questionnaire; AAQ-II = Acceptance and Action Questionnaire.
* $p < 0.05$.

Table 4
Summary statistics for BDI-II, OBQ Subscales, AAQ, and CFQ predicting DOCS subscales.

Variable	R^2	Beta	t	p	sr^2
Predicting DOCS-Contamination					
Full Model	0.30			< 0.001*	
BDI-II		0.26	2.20	0.03*	0.04
OBQ - RT		0.36	2.84	< 0.01*	0.07
OBQ - PC		0.34	2.56	0.01*	0.06
OBQ - ICT		− 0.38	− 3.07	< 0.01*	0.08
AAQ-II		− 0.11	− 0.84	0.40	< 0.01
CFQ		− 0.05	− 0.42	0.68	< 0.01
Predicting DOCS-Responsibility					
Full Model	0.41			< 0.001*	
BDI-II		− 0.07	− 0.60	0.55	< .01
OBQ - RT		0.58	4.92	< 0.01*	0.19
OBQ - PC		< 0.01	− 0.02	0.98	< 0.01
OBQ - ICT		− 0.17	− 1.51	0.14	0.02
AAQ-II		0.15	1.31	0.19	0.01
CFQ		0.22	1.94	0.06	0.03
Predicting DOCS-Unacceptable Thoughts					
Full Model	0.33			< 0.001*	
BDI-II		0.03	0.25	0.80	< .01
OBQ - RT		< 0.01	− 0.02	0.98	< .01
OBQ - PC		− 0.11	− 0.85	0.40	< .01
OBQ - ICT		0.43	3.46	< 0.01*	0.11
AAQ-II		0.03	0.22	0.82	< .01
CFQ		0.26	2.23	0.03*	0.04
Predicting DOCS-Symmetry					
Full Model	0.18			0.01*	
BDI-II		− 0.11	− 0.86	0.39	0.01
OBQ - RT		0.02	0.12	0.90	< 0.01
OBQ - PC		0.37	2.57	0.01*	0.07
OBQ - ICT		− 0.03	− 0.23	0.82	< 0.01
AAQ-II		0.22	1,61	0.11	0.03
CFQ		− 0.11	− 0.81	0.42	0.01

Note. DOCS = Dimensional Obsessive Compulsive Scale; BDI-II = Beck Depression Inventory; OBQ = Obsessive Beliefs Questionnaire; ICT = Importance of Controlling Thoughts; RT = Responsibility/Threat; PC = Perfectionism/Certainty; AAQ-II = Acceptance and Action Questionnaire; CFQ = Cognitive Fusion Questionnaire.
* $p < 0.05$.

$p = 0.06$). Adding the OBQ subscales in Step 2, however, explained significant additional variance (R^2 change = 0.25, $p < 0.001$). Conversely, addition of the AAQ-II and CFQ in Step 3 did not add to the explanatory power of the model (R^2 change = 0.01, $p = 0.56$). The final model accounted for 29.9% of the variance in DOCS-contamination scores, F (6,83) = 5.59, $p < .001$; and the BDI-II and all OBQ subscales emerged as significant unique predictors.

Predicting DOCS-responsibility. In Step 1, the BDI-II did not explain significant variance in DOCS-responsibility for harm scores ($R^2 = 0.03$, $p = 0.09$). Addition of the OBQ subscales in Step 2, however, did account for significant additional variance (R^2 change = 0.32, $p < 0.001$). Addition of the AAQ-II and CFQ in Step 3 also explained significant additional variance (R^2 change = 0.06, $p = 0.03$). The final model accounted for 41% of the variance in DOCS-responsibility scores, $F(6,83) = 8.80$, $p < 0.001$, and the OBQ–RT subscale emerged as the only significant unique predictor.

Predicting DOCS-Unacceptable Thoughts. In Step 1, the BDI-II explained significant variance ($R^2 = 0.09$, $p < .01$) in DOCS-unacceptable thoughts scores. Addition of the OBQ subscales in Step 2 explained significant additional variance (R^2 change = 0.17, $p = 0.001$); yet addition of the AAQ-II and CFQ in Step 3 did not (R^2 change = .05, $p = 0.06$). The final model accounted for 32.8% of the variance in DOCS-unacceptable thoughts scores, $F(6,82) = 6.19$, $p < 0.001$ and the OBQ-ICT and CFQ were the only significant unique predictors.

Predicting DOCS-symmetry. In Step 1, the BDI-II did not explain significant variance in DOCS-symmetry scores ($R^2 < 0.01$, $p = 0.60$). Addition of the OBQ subscales in Step 2 explained significant additional variance (R^2 change = 0.15, $p < 0.01$); however, addition of the AAQ-II and CFQ in Step 3 did not (R^2 change = 0.03, $p = 0.26$). The final model accounted for 18.4% of the variance in DOCS-symmetry scores, F (6,83) = 2.88, $p = .01$, and only the OBQ–PC subscale emerged as a significant unique predictor.

4. Discussion

Despite a wealth of evidence supporting the role of obsessive beliefs in the development and maintenance of OCD, these cognitive constructs do not entirely explain the variability in OCD symptoms. It is therefore important to consider additional frameworks that might be able to build on the explanatory power of the cognitive model. Moreover, given the heterogeneity of obsessions and compulsions, optimal explanatory models will likely vary across OCD symptom dimensions. Because of its emphasis on how one relates to his or her own thoughts and other private experiences, ACT is an excellent candidate for improving upon the traditional cognitive model. Whereas a previous study in a clinical sample found that EA did not add to the explanatory power of obsessive beliefs (Manos et al., 2010), research with analogue samples suggests that the ACT construct of cognitive fusion does add to cognitive models of OCD, specifically in explaining symptoms involving unacceptable obsessional thoughts about sex, religion, and violence accompanied by mental rituals and other covert neutralizing strategies (e.g., Reuman et al., 2017). The present study, however, is the first to investigate EA, cognitive fusion, and obsessive-beliefs as predictors of OCD symptom dimensions in a clinical sample.

Our first hypothesis that mid-level ACT constructs would show relationships to all of the OCD symptom dimensions, with the exception of contamination, was supported by our correlational analysis as well as the set of regressions using EA and cognitive fusion to simultaneously predict the OCD symptom dimensions. This is consistent with analogue studies also suggesting that ACT concepts tap into the psychopathology of OCD, yet are less applicable for understanding contamination symptoms relative to other presentations of this disorder. Indeed, contamination obsessions typically focus on external situations and stimuli (e.g., germs, bathrooms, illness; e.g., Rachman, 2004), whereas obsessions in the other symptom dimensions are more commonly focused on unwanted private experiences such as responsibility, guilt, unacceptable thoughts, sexual feelings, and "not just right" experiences (which might be triggered by external stimuli). One noteworthy exception is the OCD manifestation of "moral contamination" (Coughtrey, Shafran, Knibbs, & Rachman, 2012) in which feelings of "moral dirtiness" arise in the absence of contact with an actual contaminant. Although we did not specifically assess for such symptoms in the present study, it would be interesting to examine whether ACT constructs are more strongly associated with moral contamination symptoms than the more typical contact contamination symptoms.

Our finding that, after controlling for EA, cognitive fusion was a unique individual predictor of the responsibility for harm and the unacceptable thoughts dimensions is consistent with clinical observations. Specifically, these manifestations of OCD are characterized by an especially strong tendency to take obsessional thoughts and doubts as literal facts (e.g., "thinking about harming my baby means I'm a bad mother"; "I really could be responsible for a terrible accident and must confirm that it didn't happen"). On the other hand, that EA was a unique predictor of the symmetry symptom dimension suggests that symmetry symptoms are characterized more by the need to perform rituals to resist or control internal states, such as "not just right" feelings (Coles, Frost, Heimberg, & Rhéaume, 2003), than by the tendency to take such feelings as facts per se.

Our second hypothesis that obsessive beliefs would predict all OCD symptom dimensions was also supported. In fact, in our hierarchical regression analyses, obsessive beliefs remained as significant predictors even after accounting for depressive symptoms. This is consistent with a large body of previous research (e.g., Wheaton et al., 2010) supporting the cognitive model of OCD that obsessive beliefs are involved in the development and maintenance of obsessions and compulsions. As in previous studies, we also found that different (theoretically consistent) combinations of obsessive beliefs explained different symptom dimensions. Specifically, overestimates of threat and responsibility and the need for certainty and perfectionism predicted contamination-related OCD symptoms, overestimates of threat and responsibility predicted responsibility and checking OCD symptoms, perfectionism and the need for certainty predicted symmetry-related OCD symptoms, and exaggerated beliefs about the importance of and need to control thoughts predicted obsessions related to unacceptable (i.e., taboo or blasphemous) topics.

In our hierarchical regression analyses, mid-level ACT constructs failed to add statistically significant explanatory power above and beyond obsessive beliefs for any of the OCD symptom dimensions. Although our prediction that cognitive fusion would emerge as a significant, unique predictor of the unacceptable thoughts symptom dimension was supported, the added explanatory power was incremental and did not reach significance. This suggests that although cognitive fusion is relevant to the maintenance of this presentation of OCD, it does not provide a basis for understanding these symptoms above and beyond obsessive beliefs. Indeed, although described in different terms, there exists a large conceptual overlap between constructs of cognitive fusion and obsessive beliefs (particularly beliefs about the importance of and need to control unwanted thoughts) as both involve misperceiving harmless and universal private experiences (i.e., thoughts) as high personally meaningful and threatening.

As we expected on the basis of previous research, EA did not emerge as a unique predictor of any of the OCD symptom dimensions after accounting for depression, obsessive beliefs, and cognitive fusion. Although one potential reason for this pattern of findings is that EA is explained entirely by these other predictors, we believe that the our instrument for assessing EA in the current study (i.e., the AAQ-II) lacks the specificity for detecting EA in the context of obsessions and compulsions, especially when controlling for cognitive fusion and obsessive beliefs. Indeed, the AAQ-II is a general measure of EA that cuts across emotional valence domains and does not discriminate between specific experiential avoidance strategies. For example, items on the AAQ-II

(e.g., “emotions cause problems in my life”) are not specific to OCD but rather pertain to psychopathology more broadly and may not necessarily shift with treatment. Chawla and Ostafin (2007) have argued that the distinction between EA and related constructs such as thought suppression and avoidance coping are not entirely clear. Accordingly, more and more problem-specific forms of the AAQ have been developed (e.g., social anxiety; MacKenzie & Kocovski, 2010), and we are presently developing an OCD-specific version that might provide a better test of the extent to which this construct contributes to our understanding of OCD symptoms. Our finding that each OCD symptom dimension was predicted by a unique pattern of theoretical constructs further underscores the heterogeneity of this condition. Accordingly, conceptual and empirical work that takes a dimensional approach to OCD will provide stronger contributions to our knowledge than will focusing on the disorder more broadly.

Our findings should be considered in light of a number of limitations of the present study. First, our data were cross-sectional, and therefore preclude causal inferences. Although our results are consistent with a theoretical framework in which cognitive-behavioral and select ACT processes lead to the development of OCD symptoms, it is also plausible that obsessions and compulsions give rise to obsessive beliefs, EA, and cognitive fusion. Moreover, one or more third variables not assessed in the present study might explain the relationships we observed. Second, our reliance exclusively on self-report instruments may have inflated associations between variables due to method invariance. As some researchers have developed behavioral measures of certain obsessive beliefs (e.g., IU, TAF; Berman, Abramowitz, Wheaton, Pardue, & Fabricant, 2011; Jacoby, Abramowitz, Reuman, & Blakey, 2016), we encourage the development of analogous paradigms for assessing select ACT constructs so that the field can adapt multi-method assessment strategies for these constructs. Finally, although a primary OCD diagnosis was given to all participants following a semi-structured clinical interview, additional (comorbid) diagnoses were not specifically assigned, although we controlled for general distress using the BDI-II in our analyses.

Despite these limitations, our study findings offer directions for future research and implications for clinical work. We encourage researchers to continue the conjoint study of constructs from different traditions in CBT and ACT. Further, we encourage OCD researchers to include measures of symptom dimensions (e.g., the DOCS) in their work and examine how variables of interest relate not simply to having OCD, but also to the symptom dimensions. Understanding OCD symptom dimensions might also help foster the development of more efficient and effective psychological treatments. For example, ACT defusion strategies may be particularly useful to integrate with traditional cognitive-behavioral methods (i.e., exposure and response prevention) in the treatment of thoughts (i.e., obsessions) and compulsions related to responsibility for harm and “unacceptable" topics such as sex, violence, and blasphemy. Conversely, symptoms related to symmetry and contamination may benefit more from traditional cognitive-behavioral treatment that targets core beliefs.

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