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Intolerance of uncertainty in obsessive-compulsive disorder

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Abstract

Pathological doubt, a prominent feature of obsessive-compulsive disorder (OCD), may be related to difficulty tolerating ambiguous or uncertain situations. This is thought to be particularly true of those patients with checking compulsions. Intolerance of uncertainty (IU) has been studied extensively within the domains of worry and generalized anxiety; however, it has received relatively little empirical attention in OCD patients. We administered the Intolerance of Uncertainty Scale [Personality and Individual Differences 17 (1994) 791] to 55 clinic patients with OCD, 43 of whom had checking compulsions, and 14 nonanxious controls. OC checkers showed greater IU than did OC noncheckers and NACs. The latter two groups did not differ from each other. Furthermore, both repeating and checking rituals were associated with IU. Pathological doubt may be understood not only in terms of knowledge-based constructs, but also patients' emotional reaction to feelings of uncertainty. We discuss the implications for increasing tolerance via cognitive-behavioral therapy.

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1. Introduction

Individuals with obsessive-compulsive disorder (OCD) often exhibit pathological doubt about the properties of a stimulus, situation, or action (e.g., Rasmussen & Eisen, 1989; Reed, 1985). This phenomenon is seen across the range of OCD subtypes: for example, patients often report serious doubt about whether they have washed their hands sufficiently, have committed sins, or have discarded an important item. However, pathological doubt is most clearly evident among patients with checking rituals (Rachman & Hodgson, 1980; Rasmussen & Eisen, 1992). For example, a patient may experience persistent doubt about whether he turned off the stove completely; in response to this worry, he may check the stove repeatedly to make sure it is off. Another patient may doubt whether she accidentally hit a pedestrian with her car; she may cope with this distress by circling the block to make sure no one has been harmed.

Neuropsychiatric models of OCD posit that such behaviors might reflect impairments in verbal and/or nonverbal memory (Deckersbach, Otto, Savage, Baer, & Jenike, 2000); however, empirical evidence for such deficits has been mixed (Abbruzzese, Bellodi, Ferri, & Scarone, 1993). Other research has linked pathological doubt with decreased *confidence* in one's own memory, rather than global or specific memory deficits (e.g., Foa, Amir, Gershuny, Molnar, & Kozak, 1997; MacDonald, Antony, MacLeod, & Richter, 1997; McNally & Kohlbeck, 1993). Recently, Tolin et al. (2001) found that individuals with OCD (OCs) who had primarily checking compulsions had lower memory confidence for objects perceived as unsafe, compared to nonanxious control participants (NACs) and OCs with other types of compulsions (e.g., washing). Thus, the available data suggest a link between low memory confidence and OCD, particularly among those with checking behaviors. Nevertheless, compulsive checking is not generally observed in individuals with major depression, traumatic brain injury, or the normal aging process, all of which might also be characterized by poor memory confidence. What, then, might account for urges to perform compulsive rituals in OCD, but not in these other conditions?

One possible explanation is that OCs find uncertainty itself to be highly distressing and engage in compulsive rituals to restore certainty (e.g., Carr, 1974; Guidano & Liotti, 1983). Constans, Foa, Franklin, and Mathews (1995) found that despite no differences in reported memory vividness, OCs stated that they *desired* more vivid memories than did NACs. This exaggerated discrepancy between actual and desired quality of memory suggests an *intolerance* of uncertainty (IU), a construct that has been postulated to play a central role in anxiety (Krohne, 1989). Freeston, Rhéaume, Letarte, Dugas, and Ladoceur (1994) developed a self-report questionnaire to measure the construct of IU, which they described as “behavioral attempts to control the future and avoid uncertainty, inhibition of action based on uncertainty, emotional reactions such as frustration and stress, and cognitive interpretations that being uncertain reflects badly on a person” (p. 799). Student volunteers with self-reported symptoms of generalized anxiety and worry

were shown to score higher on the IU scale than did those without such symptoms. In a later study, this same discrepancy was shown to exist independently of depression and trait anxiety (Dugas, Freeston, & Ladoceur, 1997). IU has been associated with increased information-seeking in a moderately ambiguous problem-solving task (Ladoceur, Talbot, & Dugas, 1997). In a recent experimental study, elicitation of greater IU led to increases in reported worry compared to lower IU (Ladoceur, Gosselin, & Dugas, 2000). Thus, there is converging evidence for a specific relationship between IU and worry.

Early research also suggests that IU is present among individuals with OCD. When asked to label ambiguous line drawings, “obsessional neurotics” were less likely than other patient groups to give “can’t decide” responses, suggesting avoidance of ambiguity (Hamilton, 1957). Another plausible explanation, however, is that the obsessional participants were less willing to *report* uncertainty. Obsessive patients also asked for more repetitions of a target sound embedded in white noise when asked to make judgments about the sound (Milner, Beech, & Walker, 1971). It is unclear, however, whether this was due to IU or to decreased confidence in one’s perception (e.g., Tolin et al., 2001). Some preliminary evidence for IU among OCD patients comes from a survey of members of national groups of anxiety-disordered individuals (Steketee, Frost, & Cohen, 1998). Individuals with OCD reported less ability to tolerate uncertainty than did nonanxious and anxious control groups. However, this study did not include any independent verification of diagnostic status or severity. Rather, participants were grouped according to self-reported diagnosis of OCD or other anxiety disorders, and the OC group included individuals with Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) scores that were below the clinical range. Furthermore, participants in this study were members of national support and information organizations, raising the possibility of sampling bias. Thus, although the preliminary results are encouraging, additional controlled research is needed to increase confidence in the results and facilitate their interpretation.

The purposes of the present study are: (1) to explore the psychometric properties of the Intolerance of Uncertainty Scale (IUS) in a clinical sample, and (2) to examine the relationship between IU and OCD in a clinical sample. We predicted that OCD patients would exhibit greater IU compared to a sample of nonanxious controls. We further hypothesized that IU would be particularly pronounced among OCD patients with checking compulsions.

2. Method

2.1. Participants

Fifty-five individuals with OCD (OCs) and fourteen NACs participated in this study. The OCs were recruited from consecutive admissions to an outpatient

anxiety clinic and met *DSM-IV* (American Psychiatric Association, 1994) criteria as determined by the Structured Clinical Interview for *DSM-IV* (SCID). OCs were excluded if they: (1) met criteria for a current primary *DSM-IV* Axis I disorder other than OCD, (2) had a history of organic brain disorder, schizophrenia, or bipolar disorder, or (3) had a Y-BOCS score less than 16. NACs were recruited from the community via media advertisements. NACs were excluded if they had ever met *DSM-IV* criteria for any Axis I disorder as determined by the SCID, or had ever sought mental health treatment.

The symptom checklist of the Y-BOCS (Goodman, Price, Rasmussen, & Mazure, 1989a, 1989b) was used to determine OCs' primary compulsive symptoms. For the purposes of the present study, OCs were identified as "checkers" if they endorsed any clinically relevant compulsive checking behavior, regardless of whether other compulsions were also present. In this manner, 43 OCs were identified as checkers, and 12 were identified as noncheckers.

2.2. Measures

Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1995). The SCID was used to assess diagnostic status. The SCID is a widely-used instrument with acceptable psychometric properties (First et al., 1995).

Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989a, 1989b). The Y-BOCS is a semistructured interview that contains a symptom checklist and a severity scale. The symptom checklist includes a list of 40 obsessions and 29 compulsions each categorized according to content. Compulsion categories include: cleaning/washing, checking, repeating, counting, ordering/arranging, hoarding/collecting, mental compulsions, and miscellaneous. The severity scale of the Y-BOCS contains 10 items: 5 for obsessions and 5 for compulsions. Goodman et al. (1989a, 1989b) have reported satisfactory reliability and validity of the Y-BOCS.

Beck Depression Inventory (BDI; Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961). The BDI is a 21-item self-report measure of depression that has high reliability and validity (Beck, Steer, & Garbin, 1988).

Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994). The IUS, as described earlier, is a 27-item self-report measure of the IU construct (sample items: "uncertainty makes life intolerable;" "I always want to know what the future has in store for me;" "when I am uncertain I can't go forward"). Each item is accompanied by a 5-point scale from 1 ("Not at all characteristic of me") to 5 ("Entirely characteristic of me"). The IUS has an internal consistency of .91 and correlates significantly with measures of worry (Freeston et al., 1994), even when depression and trait anxiety are partialled out (Dugas et al., 1997). A factor analysis of the IUS yielded five factors; however, because these factors were highly interrelated, all IUS items are added to yield a single score (Freeston et al., 1994). Scores on the IUS range from 27 to 135.

2.3. Procedure

OC participants completed the study measures as part of a standard clinical intake. Clinical assessments were performed by doctoral-level clinical psychologists. NACs completed the study measures as part of a larger battery of research projects in exchange for monetary remuneration. Diagnostic interviews for NACs were performed by bachelors- or masters-level research assistants who were trained in use of the SCID and supervised by the first author.

3. Results

Demographic and questionnaire variables are shown in Table 1. As can be seen in the Table 1, the three participant groups did not differ in terms of age or gender. OC checkers reported significantly higher levels of depression than did NACs. Importantly, OC checkers and OC noncheckers did not differ in terms of overall OCD symptom severity. However, small sample size and low statistical power (observed power = .43) limit interpretability of this finding.

In the present sample, the IUS showed strong internal consistency ($\alpha = .96$). This was true for OCs ($\alpha = .96$) as well as NACs ($\alpha = .95$). The IUS correlated significantly with severity of Y-BOCS obsessions ($r = .46, P < .01$), Y-BOCS compulsions ($r = .38, P < .01$), and overall OCD severity ($r = .46, P < .01$). Table 2 shows individual bivariate correlation coefficients between the IUS and individual items on the Y-BOCS. As can be seen in Table 2, the IUS correlated significantly with the amount of time spent on obsessions and compulsions,

Table 1
Demographic and questionnaire data for OC checkers ($n = 43$), OC noncheckers ($n = 12$), and NACs ($n = 14$)

	Participant group			<i>F</i>	χ^2	<i>df</i>	Effect size ¹
	OCs		NACs				
	Checkers	Noncheckers					
Age (years)	36.52 (12.32)	34.00 (12.73)	29.00 (10.79)	2.04	–	2, 68	.06
Female (%)	47.6	46.7	28.6	–	1.62	2	.57
Y-BOCS	25.67 (5.47)	22.30 (4.22)	–	3.32	–	1, 51	.06
BDI	23.02 (12.11) a	15.36 (9.64)	8.25 (3.10) b	4.44*	–	2, 51 ²	.15
IUS	82.16 (23.60) a	58.58 (14.52) b	52.86 (20.03) b	12.52*	–	2, 66	.28

All statistics are provided as means (standard deviations) unless noted otherwise. Y-BOCS: Yale-Brown Obsessive-Compulsive Scale; BDI: Beck Depression Inventory; IUS: Intolerance of Uncertainty Scale. Within each row, means (standard deviations) with different alphabets (a, b) are significantly different from each other, $P < .05$.

¹ For Analyses of Variance, effect size estimates are calculated as partial η^2 ; for the χ^2 analysis; the effect size is w .

² Ten participants did not complete the BDI.

* Significant at $P < .05$.

Table 2

Pearson correlation coefficients between the IUS and individual Y-BOCS items

	<i>r</i>	<i>n</i>
1. Time spent on obsessions	.45**	53
2. Interference from obsessions	.31*	53
3. Distress from obsessions	.23	53
4. Resistance to obsessions	.02	53
5. Control over obsessions	.44**	53
6. Time spent on compulsions	.33*	52
7. Interference from compulsions	.34*	53
8. Distress from compulsions	.23	53
9. Resistance to compulsions	.08	53
10. Control over compulsions	.23	52

* $P < .05$.** $P < .01$.

interference from obsessions and compulsions, and control over obsessions. The IUS also correlated significantly with depression as measured by the BDI ($r = .66$, $P < .01$).

A one-way analysis of variance (ANOVA) of IUS scores by participant group yielded a significant effect, $F(2, 66) = 12.50$, $P < .001$. Post hoc analyses using the Tukey HSD test indicated that OC checkers scored higher on the IUS than did OC noncheckers and NACs, P 's $< .05$. In order to rule out the effects of depression on IU, an analyses of covariance (ANCOVA) was conducted, using BDI score as the covariate. The obtained results remained significant, $P < .05$; thus, group differences in IU cannot be attributed solely to depression.

In order to examine more fully the relationship between IU and compulsive behavior, we conducted a stepwise regression analysis. The dependent variable for this analysis was IUS score; the predictor variables (dummy-coded) were the presence or absence of each class of compulsion as assessed by the Y-BOCS. In the first step, checking compulsions emerged as a significant predictor of IU [adjusted $R^2 = 25.9\%$, $\beta = .52$, $F(1, 67) = 24.79$, $P < .001$]. In the second step, repeating compulsions also added to the prediction of IU [adjusted $R^2 = 29.3\%$, $\beta = .26$, $F(2, 66) = 15.09$, $P < .001$]. No other types of compulsive behavior were significant predictors of IU.

4. Discussion

The construct of IU holds promise for cognitive-behavioral models of anxiety disorders such as OCD. However, to date the IUS has not been studied extensively in clinical populations. In the present sample of OCD patients, the IUS showed good psychometric properties; thus, the scale seems to be appropriate for use in treatment-seeking samples of OCs.

The present results were partially supportive of our hypotheses. In particular, our data were consistent with our prediction that OC checkers would show greater IU than would OC noncheckers and NACs. However, the hypothesis that OCD patients in general would evidence greater IU compared to NACs was not supported. Perhaps compulsions such as washing are driven less by a sense of pathological doubt and IU than by other factors such as fear or disgust (Tolin, Lohr, Sawchuk, & Lee, 1997; Tolin & Woody, 2000).

In addition to checking rituals, we found that repeating rituals were associated with IU. This finding may be understood in light of clinical observations that OCD patients with checking rituals report urges to repeat certain actions (e.g., turning off a light switch) until they are performed “just right.” Inability to tolerate this sense of doubt may lead them to repeat the action.

The obtained association between IU and checking and repeating rituals raises new questions about the phenomenon of pathological doubt. Whereas previous research on memory confidence provides clues as to the cognitive features of doubt in OCD, the present findings appear to tap an emotional feature as well. This distinction has been raised in the context of pathological worry, where it was noted that individuals’ emotional approaches to problem-solving played a role that was at least as important as their cognitive (knowledge-based) approaches (Dugas, Letarte, Rhéaume, Freeston, & Ladoceur, 1995; Metzger, Miller, Cohen, Sofka, & Borkovec, 1990). Early OCD research is consistent with this hypothesis: OCs show a reluctance to take risks, even in the absence of exaggerated beliefs about the probability of making a mistake (Walker, 1967; cited in Kozak, Foa, & McCarthy, 1988). Thus, checking and repeating may be related not only to exaggerated beliefs about the probability and cost of unwanted outcomes, but also to heightened feelings of distress when faced with multiple possibilities.

The limitations of the present study highlight the need for additional research in this area. One concern is that participants may have rated how they feel about uncertainty in general, rather than in specific OCD-relevant situations; thus, the obtained results may or may not reflect their actual emotional response to situations such as leaving a door unlocked or an oven turned on. Experimental manipulation of uncertainty and its costs (e.g., Ladoceur, Gosselin, et al., 2000) are needed to explore the functional role IU plays in obsessional distress and urges to ritualize. Furthermore, in the present study, patients completed the IUS at pretreatment only. Given that many cognitive-behavioral interventions emphasize learning to tolerate discomfort (e.g., Freeston & Ladoceur, 1999; Hayes, Strosahl, & Wilson, 1999), the IUS, used as a process measure in outcome studies, could yield important information about the mechanisms by which cognitive-behavioral therapies reduce fear. A recent study indicates that IU decreases following treatment for generalized anxiety disorder (Ladoceur, Dugas, et al., 2000); parallel studies may help to reveal mechanisms of change in treatment for OCD.

In light of the present findings and those of Ladoceur, Dugas, et al. (2000), clinicians treating OCD patients should assess fears related to IU and this should be a focus in cognitive-behavioral therapy (e.g., exposure and ritual prevention).

That is, therapy should include exercises designed to weaken associations between uncertainty and high levels of anxiety. In vivo exposures, for example, might be expanded to incorporate situations that arouse feelings of uncertainty (but not necessarily compulsive behaviors). For example, patients might be directed to engage in tasks such as filling out forms very quickly, or performing challenging tasks with incomplete instructions. In addition, research indicates that adding imaginal exposure to in vivo exposure may contribute to the maintenance of therapeutic gains (Foa, Steketee, Turner, & Fischer, 1980); such imaginal exposures might be targeted toward IU. For example, after driving down a crowded street, a patient with fears of hitting pedestrians could (in addition to not checking) perform imaginal exposure to never discovering whether he/she actually injured someone. From a strictly behavioral point of view, such exercises should encourage habituation to feelings of uncertainty. From a cognitive perspective, such exercises would be hoped to “decatastrophize” uncertainty and increase patients’ self-efficacy to tolerate the feeling of uncertainty. Controlled studies are needed to examine whether uncertainty-related exposures decrease IU, and whether decreases in IU mediate short- and long-term reductions in OCD symptom severity.

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