



# Just to be certain: Confirming the factor structure of the Intolerance of Uncertainty Scale in patients with obsessive-compulsive disorder



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## ABSTRACT

Intolerance of Uncertainty (IU) is a cognitive construct in obsessive-compulsive disorder (OCD); yet no studies exist confirming the factor structure of the most widely used measure of IU, the Intolerance of Uncertainty Scale (IUS), in OCD patients. Moreover, no studies have examined how scores on this measure relate to OCD symptom dimensions. Accordingly, the present study examined a 12-item two-factor revised version of the IUS (IUS-12) in 205 OCD patients. Confirmatory factor analysis verified the scale's two-factor structure. The measure also demonstrated high internal consistency and the IUS-12 was correlated moderately with another self-report measure of IU. Finally, theoretically consistent and specific relationships emerged between the IUS-12 and OCD symptom dimensions. These findings are discussed in terms of implications for the assessment and treatment of OCD, and specifically how elevated scores on the IUS-12 subscales may be utilized to identify subtleties in the presentation of OCD-related problems with IU.

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## 1. Introduction

*Intolerance of uncertainty* (IU) refers to “beliefs about the necessity of being certain, about the capacity to cope with unpredictable change, and about adequate functioning in situations which are inherently ambiguous” (*Obsessive, Compulsive Cognitions Working Group [OCCWG], 1997, p.678*) and is considered an important domain of dysfunctional cognition associated with anxiety disorders such as obsessive-compulsive disorder (OCD; *OCCWG, 1997*) and generalized anxiety disorder (GAD; *Dugas, Buhr, & Ladouceur, 2004*). Individuals who are high in IU have a lower perceptual threshold of ambiguity, find uncertainty to be stressful and upsetting, believe that uncertainty reflects poorly on a person and should be avoided, and have difficulty functioning in uncertain or ambiguous situations (*Buhr & Dugas, 2002; Krohne, 1993*).

Most studies of IU use the Intolerance of Uncertainty Scale (IUS; *Freeston, Rhéaume, Letarte, & Dugas, 1994*), a 27-item self-report

measure assessing cognitive, behavioral, and emotional responses to uncertainty in everyday life. The IUS is internally consistent ( $\alpha$ 's = .91–.94) and has good test-retest reliability ( $r = .74$ ; *Buhr & Dugas, 2002; Freeston et al., 1994*), yet a number of concerns have also been raised. First, the IUS is atheoretical and was derived on the basis of clinical judgment rather than empirically (*Birrell, Meares, Wilkinson, & Freeston, 2011*). Second, it has several items that appear to pertain specifically to GAD (e.g., “My mind can't be relaxed if I don't know what will happen tomorrow”), and some researchers have speculated that as a result the IUS better accounts for symptoms of worry than symptoms of other anxiety disorders (*Gentes & Ruscio, 2011*). Third, the convergent and divergent validity of the IUS are not well established (*Buhr & Dugas, 2002; Freeston et al., 1994*). Fourth, factor analytic studies have yielded little consensus about the number of IUS factors. Authors have reported two- (*Carleton, Norton, & Asmundson, 2007; Sexton & Dugas, 2009*), four- (*Berenbaum, Bredemeier, & Thompson, 2008; Buhr & Dugas, 2002; Norton, Sexton, Walker, & Norton, 2005*),<sup>1</sup> and five- (*Freeston*

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<sup>1</sup> Since results in the original *Norton et al. (2005)* data were inconsistent across the four racial/ethnic groups studied (i.e., African American, Caucasian, Hispanic, South East Asian) and each group had a relatively small sample size ( $n_s = 93\text{--}149$ ), *Birrell et al. (2011)* described results from an unpublished reanalysis of the dataset in which these four groups were combined into one larger sample for factor-analysis, which resulted in the 4 factors reported here.

et al., 1994) factor solutions; with many factors having poor inter-pretability and items that cross-load. Finally, factor analytic studies of the IUS have been limited by their reliance on principal components analysis, which is actually conceptually and mathematically distinct from factor analysis (Russell, 2002), as well as on eigenvalues > 1 and Cattell (1966) to determine the number of factors to retain, which has potentially problematic consequences (Preacher & MacCallum, 2003).

As a result of these limitations, Carleton et al. (2007) investigated whether item-reduction would improve the IUS factor structure without substantially reducing its reliability. They identified (in an undergraduate sample) a psychometrically stable 12-item two-factor version (IUS-12) that, while more parsimonious, still demonstrated high internal consistency and construct validity. The IUS-12 also significantly predicted symptoms of generalized anxiety and worry after accounting for variance shared with general symptoms of anxiety and depression. Other researchers have also examined the IUS-12, consistently reporting good psychometric properties relative to the original IUS (Helsen, Van, Vlaeyen, & Goubert, 2013; Khawaja & Yu, 2010) as well as associations with symptoms of OCD, GAD, social anxiety, panic disorder, health anxiety, neuroticism, and trait anxiety (Boelen & Carleton, 2012; Boelen, Vrinssen, & van Tulder, 2010; Calleo, Hart, Björngvinsson, & Stanley, 2010; Carleton, Collimore, & Asmundson, 2010; Khawaja & Yu, 2010; Mahoney & McEvoy, 2012; McEvoy & Mahoney, 2011, 2012). Finally mounting evidence suggests the IUS-12 consists of two-factors representing approach and avoidance responses to uncertainty, respectively (Birrell et al., 2011). The first factor, Prospective IU, measures desire for predictability, preferences for knowing what the future holds, anxiety about future uncertain events, and active engagement in seeking information to increase certainty. The second, Inhibitory IU, measures avoidance and paralysis in the face of uncertainty.

The development and validation of the IUS-12 has helped advance the measurement of IU; yet previous studies of this measure have mostly been conducted with undergraduate samples who are relatively young, predominantly female, and have low mean IUS scores (Birrell et al., 2011). Surprisingly, only two studies (Carleton et al., 2012; McEvoy & Mahoney, 2011) have conducted factor analyses of the IUS-12 in clinical samples. These studies both found that the best fitting model was the 12-item two-factor version identified by Carleton et al. (2007). One of these studies, however, included a mixed sample of patients with various anxiety and depressive disorders (McEvoy & Mahoney, 2011). The second conducted separate CFAs for each diagnostic group (i.e., various anxiety and depressive disorders), but acknowledged that the relatively small sample sizes were insufficient for robust CFA (*ns* ranging from 26–120), and that their findings were only preliminary (Carleton et al., 2012). Both studies (Carleton et al., 2012; McEvoy & Mahoney, 2011) called for further replication and extension of their findings in other (more homogeneous) clinical samples.

Accordingly, in the present study we examined the factor analytic structure, internal consistency, and validity of the IUS-12 in a large clinical sample of treatment-seeking patients with OCD. We chose to specifically examine patients with OCD because (a) there is consistent evidence for a relationship between IU and OCD symptoms (Calleo et al., 2010; Dugas, Gosselin, & Ladouceur, 2001; Holaway, Heimberg, & Coles, 2006; Steketee, Frost, & Cohen, 1998; Tolin, Abramowitz, Brigidi, & Foa, 2003; Tolin, Worhunsky, & Maltby, 2006), and (b) we aimed to also examine relationships between IU and the different OCD symptom dimensions (e.g., contamination, symmetry), which have not been investigated to date. Surprisingly, no previous studies have examined this measure in an exclusively OCD clinical sample.

From a cognitive-behavioral perspective, IU is thought to play a role in the escalation of normally occurring intrusive thoughts into

clinical obsessions. For example, an individual with an unwanted intrusive thought about stabbing her child might think, “I need to know *for certain* that I am not a bad mother and won’t harm my child.” This gives rise to distress, which is then neutralized using maladaptive checking or re-assurance-seeking rituals with the goal of attaining certainty that the negative event will not transpire. Such rituals further maintain the obsessional thinking and need for certainty (e.g., Rachman, 2002; Radomsky, Gilchrist, & Dussault, 2006).

A highly heterogeneous condition, OCD consists of four empirically derived theme-based symptom dimensions: contamination, responsibility for harm, unacceptable thoughts, and order/symmetry (e.g., Abramowitz et al., 2010; McKay et al., 2004). In studies examining associations between IU and particular OCD themes, IU appears to be most strongly related to responsibility/doubting obsessions and checking compulsions (Abramowitz, Nelson, Purdon, Antony, & Summerfeldt, 2007a; Calleo et al., 2010; Holaway et al., 2006; Overton & Menzies, 2002; Tolin et al., 2003), yet it is also associated to some degree with the other symptom dimensions (Abramowitz & Deacon, 2006; Calleo et al., 2010; Holaway et al., 2006; Tolin, Brady, & Hannan, 2008; Wheaton, Abramowitz, Berman, Riemann, & Hale, 2010). The few studies (Boelen & Carleton, 2012; Carleton et al., 2012; McEvoy & Mahoney, 2011) that have examined the IUS-12 subscales in relation to OCD symptoms have reported conflicting findings as to whether Inhibitory IU (Boelen & Carleton, 2012, Study 1), Prospective IU (Boelen & Carleton, 2012, Study 2; McEvoy & Mahoney, 2011), or neither (Carleton et al., 2012) are uniquely related to OC symptoms. Moreover, these studies only considered global OCD symptom severity rather than the OCD symptom dimensions; thus it remains unknown whether these dimensions differentially relate to the different dimensions of uncertainty as measured by the IUS-12.

On the basis of previous research, we hypothesized that in a clinical sample of patients with OCD: (a) confirmatory factor analysis (CFA) would support a 2-factor structure of the IUS-12, as previously defined (Carleton et al., 2007, 2012; McEvoy & Mahoney, 2011), (b) the IUS-12 will demonstrate high internal consistency, and (c) would correlate strongly with another self-report measure of IU. In addition, we tested the hypothesis that the IUS-12 and its subscales would be associated with the OCD symptom dimension involving obsessions about responsibility for harm and checking rituals. Due to inconsistent findings, however, we did not have a priori hypotheses about the other symptom dimensions.

## 2. Materials and methods

### 2.1. Participants

Participants were 205 treatment-seeking patients (96 men and 108 women) at the Obsessive-Compulsive Disorders Center at Rogers Memorial Hospital in Oconomowoc, Wisconsin with a primary diagnosis of OCD. The majority of the sample was enrolled in the residential program for OCD (77%; *n* = 158); the remainder was enrolled in the Center’s OCD intensive outpatient program (23%; *n* = 47). The majority of patients also had co-occurring diagnoses (80%; *n* = 164); the most common were other anxiety disorders (19%) followed by unipolar depression (37%). The group’s mean age was 29.9 years (*SD* = 11.10; range = 18–63) and the sample was 91% Caucasian, 2% African American, 2.5% Asian, 3.4% Latino/Hispanic, and 1% Indian. The mean number of years of education participants reported was 14.87 (*SD* = 2.36; range = 12–20).<sup>2</sup>

<sup>2</sup> Due to missing data, years of education was only available for a subset of the sample (*n* = 120).

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