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Abstract

Broad and narrow specificity are current issues within cognitive models of psychopathology. The aim of this study was to describe the nature of the relationship between inflated responsibility (measured with the Responsibility Attitudes Scale) and obsessive-compulsive symptoms (measured with the Yale-Brown Obsessive Compulsive Scale self-report) and between intolerance of uncertainty (measured with the Intolerance of Uncertainty Scale) and generalized anxiety symptoms (measured with the Worry and Anxiety Questionnaire). A sample consisting of undergraduates was used in both cases. Hierarchical regression analysis and a methodological approach proposed by Garber and Hollon (1991) were used. The results showed that responsibility was relevant to, and specific to, obsessive-compulsive symptoms even when other associated variables were controlled for. Intolerance of uncertainty was relevant to, but not specific to, generalized anxiety symptoms. These results clarify the roles of both responsibility and intolerance of uncertainty in cognitive models of obsessive-compulsive disorder and generalized anxiety disorder and are relevant for potential treatments that focus on these variables.

Keywords

Responsibility; Intolerance of Uncertainty; Obsessive-Compulsive Behavior; Generalized Anxiety; Specificity.

Introduction

Broad and narrow specificity are current issues within cognitive models of anxiety disorders. For example, specificity is crucial in establishing the role of responsibility, posited as central to some models of obsessive-compulsive disorder (OCD) (Salkovskis, 1985, 1999), in a similar way to the role of intolerance of uncertainty in a model of generalized anxiety disorder (GAD) (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Dugas, Marchand, & Ladouceur, 2005). Given the ethical and methodological difficulties involved in conducting experiments to establish causal relationships in clinical psychology, Garber and Hollon (1991) thus suggested that it is essential to establish the role of specificity when validating a theoretical model. These authors propose two types of specificity: broad and narrow. Broad specificity refers to the specificity of a variable in a given disorder, although this variable is not specific to the general category to which the disorder belongs (e.g., the specificity of responsibility in OCD compared with anxiety disorders or general psychopathology). Narrow specificity refers to the specificity of a variable in a given disorder in relation to another particular disorder (e.g., the specificity of responsibility in OCD compared with GAD or major depressive disorder)¹.

The aim of this study was to investigate the relevance and narrow specificity of responsibility and intolerance of uncertainty in obsessive-compulsive (OC) and general anxiety (GA) symptoms, respectively, by performing lax, moderate and stringent tests.

¹ Although the DSM-5 moved OCD from anxiety disorders to its own category, in this work, OCD will be considered an anxiety disorder because the preparation of this paper followed the DSM-IV. Additionally, the current WHO classification system, the ICD-10, still considers OCD an anxiety disorder, and even the DSM-5, despite this separation, considers anxiety to be an important feature of OCD. Furthermore, the DSM-5 considers OCD to be very close to anxiety disorders. There is also a long tradition of research of OCD as an anxiety disorder that cannot be ruled out because of this change in the DSM-5.

The specificity of responsibility and intolerance of uncertainty in these disorders is particularly relevant because responsibility (or some form of it) and intolerance of uncertainty (or very similar concepts) are also salient in some clinical presentations of OCD and GAD, respectively.

Responsibility, OCD, and GAD

Inflated responsibility (Obsessive Compulsive Cognitions Working Group, 1997; Salkovskis, 1985, 1999) is one of the main concepts in modern cognitive models of OCD. In Salkovskis' cognitive model of OCD, responsibility implies "...the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes are perceived as essential to prevent" (Salkovskis, 1999, p. S32). Many studies have empirically tested the validity of this construct and its relationship to OCD using experimental (Arntz, Voncken, & Goosen, 2007; Bouchard, Rheume, & Ladouceur, 1999; Ladouceur, Rhéaume, & Aublet, 1997; Ladouceur et al., 1995; Lopatka & Rachman, 1995; Shafran, 1997) and correlational (Freeston, Ladouceur, Gagnon, & Thibodeau, 1993; Freeston, Ladouceur, Thibodeau, & Gagnon, 1992; Frost, Steketee, Cohn, & Griess, 1994; Rachman, Thordarson, Shafran, & Woody, 1995; Rheume, Ladouceur, Freeston, & Letarte, 1994; Rheume, Freeston, Dugas, Letarte, & Ladouceur, 1995) methodologies.

However, few works have examined the relationship between responsibility and OCD in comparison with other disorders, symptoms, or behaviors. Regarding broad specificity, Salkovskis et al. (2000) found that their OCD patient group scored higher in responsibility (as assessed with the Responsibility Attitudes Scale [RAS; Salkovskis et al., 2000]) than did their "Other anxiety disorders" group and their nonclinical group. The Obsessive Compulsive Cognitions Working Group (OCCWG; 2001) found that

their OCD patient group scored higher in responsibility (as assessed with the Responsibility subscale of the Obsessive Beliefs Questionnaire; OBQ) than did their “Other anxiety disorders” group. In a later study using the same instrument and a larger sample, Taylor et al. (2006) found that responsibility was highly correlated with measures of OCD, anxiety, and depression and discriminated well between patients with OCD and patients with other anxiety disorders. In addition, in the validation study of the 44-item version of the OBQ (OBQ-44), OCD patients also scored higher in the responsibility/threat estimation factor than did patients with other anxiety disorders (OCCWG, 2005). Although the broad specificity of responsibility in relation to OC symptoms appears to be well established, there is evidence against it. For example, Tolin, Worhunsky and Maltby (2006) found no differences in responsibility (assessed with the OBQ-44 responsibility/threat estimation subscale) among three groups of OCD patients, an “Other anxiety disorders patients” group, and nonclinical participants. Also, (Baptista, Magna, McKay, & Del-Porto, 2011) found that a sample of patients of a chronic diseases clinic scored higher than a sample of patients with OCD in all OBQ domains. Even some authors question the relevance of responsibility, arguing that it is a byproduct of other constructs such as metacognitions (Gwilliam, Wells, & Cartwright-Hatton, 2004; Myers & Wells, 2005).

To our knowledge, no studies have explicitly tested the narrow specificity of responsibility in OCD, especially following the guidelines of Garber and Hollon (1991). This oversight could be because this test is counterintuitive; that is, to test the narrow specificity of responsibility in OCD, the relationship between responsibility and other disorders in the same category must be tested. Therefore, studies that tested the association between responsibility and other concepts that were unrelated to OCD, such

as worry, one of the main characteristics of GAD, could be considered initial tests of the narrow specificity of responsibility in OCD. In this vein, Calleo, Hart, Björgvinsson, and Stanley (2010) found in an inpatient OCD sample that the OBQ-44 responsibility/threat estimation subscale was correlated with worries and obsessions, even when the effect of depression was controlled for. Startup and Davey (2003) reported that responsibility, in combination with negative mood, was closely related to catastrophic thinking and excessive worry and found that “high worriers” showed significantly higher responsibility than “low worriers.” Montorio, Wetherell and Nuevo (2006) also found that responsibility was related to worry and was stronger in older adults with GAD than in older adults without GAD. Furthermore, (Fergus & Wu, 2009) found in a nonclinical sample that the OBQ-44 responsibility/threat estimation subscale was related to worries but not to obsessions when negative affect and the effects of other beliefs measures were separated. The results from these studies appear to contradict the tenet that responsibility is specific to OC symptoms because responsibility is also related to worry. However, evidence using a GA measure other than worry is needed.

In summary, most studies have shown that responsibility measures discriminate between OCD patients and non-OCD anxiety patients, but there is contradictory evidence such as the study by Tolin et al. (2006). Thus, responsibility may be broadly specific to OCD because it appears to be an attribute of the OCD category (or at least to some types of OC symptoms; see Taylor et al., 2006) but not to the general category of anxiety disorders. Some studies raise questions regarding the narrow specificity of responsibility in OCD. These studies show that responsibility measures also correlate with worry scores (sometimes more closely correlating with worry than with OC

symptoms, as shown in the study by Fergus and Wu, 2009). However, to our knowledge, no studies have tested the narrow specificity of responsibility in OCD by applying the methodology proposed by Garber and Hollon (1991).

The foregoing studies (Calleo et al., 2010; Fergus & Wu, 2009; Startup, 2003) suggest that GAD could be a useful candidate for investigating the narrow specificity of responsibility in OCD, given the relationship between responsibility and worry.

Intolerance of uncertainty, GAD and OCD

Intolerance of uncertainty has been posited as a central component of one of the most important GAD cognitive models (Dugas et al., 1998, 2005). In this model, intolerance of uncertainty is defined as “...a dispositional characteristic resulting from negative beliefs about uncertainty and its implications” (Dugas & Robichaud, 2007, p. 24). This concept has been linked to worry (a central feature of GAD) in multiple studies using the Intolerance of Uncertainty Scale (IUS; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Moreover, some of these studies explicitly followed the recommendations of Garber and Hollon (1991). Thus, Ladouceur et al. (1999) found evidence of the broad specificity of intolerance of uncertainty in a study performed with patients diagnosed with GAD because intolerance of uncertainty distinguished between GAD patients and a group of patients with other anxiety disorders.

As argued by Gentes and Ruscio (2011), there are serious doubts about the narrow specificity of intolerance of uncertainty in GAD because this concept has been linked to other disorders, such as OCD (Holaway, Heimberg, & Coles, 2006; Tolin, Abramowitz, Brigidi, & Foa, 2003), major depressive disorder (Gentes & Ruscio, 2011), and panic disorder (Carleton et al., 2014). In fact, the OCCWG described a quite

similar construct, tolerance of uncertainty², as one of the main beliefs relevant to OCD, and a number of studies showed that this construct is consistently linked to OCD (Calleo et al., 2010; Obsessive Compulsive Cognitions Working Group, 1997; Obsessive Compulsive Cognitions Working Group, 2005; Steketee, Frost, & Cohen, 1998; Tolin et al., 2006).

However, the GAD definition of intolerance of uncertainty could be narrowly specific to GAD. The relationship between intolerance of uncertainty and OCD could be attributable to OCD's relationship with tolerance of uncertainty because measures of both concepts are highly correlated (Calleo et al., 2010). The relationship between intolerance of uncertainty and panic disorder could be limited to only one of its components, inhibitory intolerance of uncertainty (Calleo et al., 2010). Moreover, Tolin et al. (2006) argue that negative emotion variables (such as depression and anxiety) might confound the relationship between cognitive variables and disorders; thus, these variables should be removed from the analysis to be certain about the relationship between intolerance of uncertainty and the different disorders. Additionally, the finding by Gentes and Ruscio (2011) that intolerance of uncertainty, measured with the IUS, is highly correlated with major depressive disorder scales could be interpreted in this way. Although there is no research (or theoretical framework) that links intolerance of uncertainty and depression, the correlation between measures of this disorder and the IUS is strong according to Cohen's convention (Cohen, 1992). This finding could be because the authors did not test the hypothesis using patients with depression as their main diagnosis, but with the depression scores of patients with different disorders or

² The main difference between OCCWG's tolerance of uncertainty and Dugas' intolerance of uncertainty is that the former is formulated as an irrational belief (OCCWG, 1997) and the latter is conceptualized as a way to react in uncertain situations (Freeston et al., 1994).

nonclinical samples. This result highlights the necessity of controlling for negative affect to clarify the relationship between any related disorder and intolerance of uncertainty. As far as we know, there is no evidence of testing the narrow specificity of the GAD definition of intolerance of uncertainty in GAD in comparison with OCD using Garber and Hollon's (1991) guidelines and controlling for negative emotions. Given both the theoretical and the empirical relationships between intolerance of uncertainty and OCD, this disorder would be an accurate choice for testing the narrow specificity of intolerance of uncertainty in GAD.

Aims and hypotheses

We propose four methodological issues that might help to clarify the relationship between these cognitive variables and the disorders.

First, we suggest that two steps must be followed when evaluating the association between a variable and a disorder: relevance and specificity. First, the variable's relevance to a specific disorder must be established by a significant association between a cognitive variable and a marker of the disorder. Second, and this step is the main issue, to establish narrow specificity, the variable must not be associated with markers of other disorders. That is, we consider that the strongest test of narrow specificity must ensure that the target variable is related to only one disorder and is not related to another disorder or category. We understand that this test can be performed with studies that compare the levels of responsibility in two or more samples and with studies that correlate a measure of responsibility with measures of the selected disorders. Both study types have a similar problem. Regarding the sample comparison studies, it is virtually impossible that any type of sample will score zero on a measure of

responsibility or of intolerance of uncertainty. Additionally, in relation to the correlational studies, it is very difficult to find a measure of psychopathology that does not correlate at all with a measure of responsibility or intolerance of uncertainty. Therefore, a method must be operationalized for testing whether the relationship between a cognitive variable and a disorder is contaminated by other variables. That is, the more lax test would be a simple correlation, but more stringent tests that take into account the influence of other variables would be needed. The next issues are directed at solving this problem.

The second issue is that there is some evidence that supports correlations between measures of intolerance of uncertainty and responsibility, on the one hand, and measures of OCD and GAD, on the other. However, it is difficult to decide whether these correlations are attributable to: 1) a substantive relationship between the underlying constructs; 2) both disorders being correlated with a third variable; 3) problems with definitions and/or measurement leading to overlap; or 4) part of the relationship being accounted for by common method variance. This issue could be addressed statistically by considering the contribution of OCD to GAD, and of responsibility to intolerance of uncertainty, and vice-versa. Thus, we would obtain a measure of the strength of the association between the cognitive variables and the disorders by simultaneously considering the effects of the other variables. This test would be more stringent than a simple correlation. Therefore, moderate tests will be conducted that consider the influence of other cognitive variables and disorders.

The third issue was introduced in previous sections. Although negative mood is seen as a consequence of beliefs and appraisals in cognitive models of anxiety and related disorders, the level of endorsement of negative beliefs may also be the

consequence of mood disturbance (Tolin et al., 2006). To test whether negative mood is a cause or a consequence of the negative beliefs is not the issue of this study. However, the possible influence of these variables in the relationship between cognitive variables and disorders must be considered. Consequently, the most stringent test of relevance and specificity should also take anxiety and depression into account as markers of negative emotions when testing both relevance and specificity hypotheses. Thus, stringent tests will be conducted that consider the influence of negative emotions (depression and anxiety) separate from the effects of other cognitive variables and disorders.

The fourth issue is the use of a nonclinical sample in a clinical-related research. Gibbs (1996) and (Abramowitz et al., 2014) argued that current models of OCD are based on the assumption that the difference between psychopathology and mental health is a matter of degree. These authors also stated that low-level OC symptoms frequently occur in nonclinical populations and that associated symptoms and psychological characteristics follow a very similar pattern in both populations. Following these arguments, we believe that studies with nonclinical samples are valid for examining the relationship between personality traits or cognitive variables and the severity of psychological symptoms because these symptoms are also found in nonclinical populations, although to a lesser degree. Clearly, the results from these studies cannot be directly generalized to clinical populations, but they are a valid way to explore the relationships between these variable types.

Thus, based on data that support the broad specificity of responsibility in OCD and on the characteristics common to OCD and GAD described above, we suggest the following hypotheses:

Hypothesis 1. Responsibility is relevant to OC behavior after considering the potential effects of i) intolerance of uncertainty and GA symptoms (moderate test) and ii) both the former and measures of anxiety and depression (stringent test).

Hypothesis 2. Responsibility is specific to OC behavior in relation to GA symptoms, even when considering the potential effects of i) intolerance of uncertainty and OC behavior (moderate test) and ii) both the former and measures of anxiety and depression (stringent test).

Similarly, based on data that support the potentially broad specificity of intolerance of uncertainty in GAD and the characteristics that are common to GAD and OCD, as described above, we suggest the following hypotheses:

Hypothesis 3. Intolerance of uncertainty is relevant to GA symptoms after considering the potential effects of i) responsibility and OC behavior (moderate test) and ii) both the former and measures of anxiety and depression (stringent test).

Hypothesis 4. Intolerance of uncertainty is specific to GA symptoms in relation to OC behavior, even when considering the potential effects of i) responsibility and GA symptoms (moderate test) and ii) both the former and measures of anxiety and depression (stringent test).

Methods

Participants

This study employed a convenience sample of 331 unselected Caucasian undergraduate students (81.6% women; 88.8% single; mean age = 22.66; SD = 4.93) who attended the University of Malaga (Spain), most of whom lived in the urban areas surrounding the university. There were no inclusion or exclusion criteria because a general population sample was required. Statistically significant differences between

men and women were found only in age and anxiety.

Measures

Yale-Brown Obsessive-Compulsive Scale, self-report (Y-BOCS-SR; Goodman et al., 1989; Steketee, Frost, & Bogart, 1996; Spanish version by Godoy & Gavino, unpublished manuscript).

The Y-BOCS-SR is a self-report measure of OC symptoms on which the participant scores five items referring to the severity of OCD symptoms on a 5-point Likert scale. Steketee et al. (1996) report that the self-report version of this scale has high internal consistency ($\alpha = .89$) and excellent test-retest reliability ($r = .88$). The Spanish version of the Y-BOCS-SR (Godoy & Gavino, unpublished manuscript) used in this study was translated using the standard forward-backward translation technique. This version shows high internal consistency ($\alpha = .86$), high test-retest reliability ($r = .83$), and adequate convergent validity with other OCD measures ($r = .62$), similar to that shown by the original English Y-BOCS (e.g., Foa et al., 2002). The internal consistency of this measure in this sample was also high ($\alpha = .87$).

Worry and Anxiety Questionnaire (WAQ; Dugas et al., 1995; Spanish version by Ibáñez et al., 2000).

This questionnaire consists of 11 items that describe the DSM-IV criteria for a diagnosis of GAD. The patient has to score each item on a 9-point Likert scale. Dugas et al. (2001) reported that this measure has adequate test-retest reliability and good convergent and discriminant validity (Dugas et al., 2001). The Spanish version of this questionnaire has good internal consistency ($\alpha = .91$) and high test-retest reliability ($r = .80$). The internal consistency of this measure in this sample was also high ($\alpha = .87$).

Beck Depression Inventory (BDI; Beck, Rush, Shaw & Emery, 1979; Spanish version by Sanz & Vázquez, 1998).

This inventory consists of 21 multiple-choice items referring to typical depression symptoms. This scale has high internal consistency in clinical and nonclinical samples ($\alpha = .81-.86$), and its test-retest reliability is also good ($r = .74$; Beck, Steer, & Garbin, 1988). The BDI Spanish version has similar psychometric properties in clinical (Vázquez & Sanz, 1999) and nonclinical (Sanz & Vázquez, 1998) populations. The internal consistency of this measure in this sample was high ($\alpha = .83$).

Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988; Spanish version by Sanz & Navarro, 2003).

This inventory consists of 21 items that correspond to the same number of anxiety symptoms, which are assessed using a 4-point Likert scale. The BAI has excellent internal consistency ($\alpha = .92$) and very good test-retest reliability ($r = .75$) (Beck et al., 1988). The Spanish version (Sanz & Navarro, 2003) has similar psychometric properties to the original version. The internal consistency of this measure in this sample was high ($\alpha = .83$).

RAS (Salkovskis et al., 2000; Spanish version by Godoy & Gavino, unpublished manuscript).

This 26-item scale measures typical OCD beliefs about responsibility using a 7-point Likert scale. This scale has high internal consistency ($\alpha = .92$), excellent test-retest reliability ($r = .94$), and acceptable concurrent validity ($r = .54-.57$) (Salkovskis et al., 2000). The Spanish version of the scale used in this study (Godoy & Gavino, unpublished manuscript) was translated using the forward-backward translation technique. This version has high internal consistency ($\alpha = .90$), high test-retest

reliability ($r = .80$), and good convergent validity with the responsibility subscales of the OBQ-44 ($r = .76$) and the Inventory of Beliefs Related to Obsessions ($r = .63$) developed by Freeston et al. (1993). The internal consistency of this measure in this sample was excellent ($\alpha = .94$).

IUS (Freeston et al., 1994; Spanish version by Gonzalez et al., 2006).

This 27-item questionnaire assesses intolerance of uncertainty using a 5-point Likert scale. This scale has excellent internal consistency ($\alpha = .91$), and its test-retest reliability is good over a 5-week period ($r = .78$; Dugas *et al.*, 1995). Both convergent and discriminant validity are good (Dugas et al., 2001). González et al. (2006) report that the internal consistency of the Spanish adaptation ranges from .95 to .93, and its test-retest reliability is .69. The internal consistency of this measure in this sample was excellent ($\alpha = .94$).

To use measures that were as close as possible to the original constructs of inflated responsibility for OCD and intolerance of uncertainty for GAD, we chose the RAS and the IUS to assess inflated responsibility and intolerance of uncertainty, respectively, instead of other similarly valid but more general options (e.g., the OBQ-44). The RAS and IUS were developed by research groups that originally proposed the concepts of inflated responsibility and intolerance of uncertainty. Both measures have good concurrent and predictive validity and the highest content validity because the OBQ-44 tolerance of uncertainty scale includes items related to perfectionism.

Procedure

The students voluntarily completed the self-administered questionnaires used in this study during a class period. They were offered an extra half point in their final

marks in the subject for participating in the study and correctly completing the questionnaires. All students signed an informed consent form prior to their participation in this research. The study was approved by the regional research board.

Results

The means, standard deviations, and minimum and maximum scores of each variable are shown in the first part of Table 1. The means and standard deviations of all variables were similar to those found in nonclinical and undergraduate samples in previous studies, except for the standard deviation of the WAQ, which was greater than that found in a similar sample studied by Olatunji, Moretz, and Zlomke (2010).

Please insert Table 1 here

Spearman's rho correlations were calculated between all variables (see second part of Table 1) to determine the relationship between all cognitive variables and markers of the symptoms. Despite they are unconventional, Rho correlations are more appropriate for ordinal variables than Pearson zero-order correlations. So, given that the variables of the study were obtained using questionnaires, which used Likert scales, we decided that Spearman's Rho correlations was the right statistical choice. However, the results did not varied significantly from those obtained using Pearson zero-order correlations. Table 1 indicates significant positive correlations between all variables, but, as argued previously, the observed relationships can be construed in various ways. Therefore, a series of tests between the belief measures and markers of the symptoms was conducted, while the other variables were controlled for, as mentioned in the

introduction. Thus, we decided that hierarchical regression analysis was a reasonable statistical choice even though most of the variables were not distributed normally (as would be expected in a nonclinical sample). Because of the high correlations between variables, there was a risk of multicollinearity; thus, the tolerance for each equation was obtained.

Narrow specificity of responsibility in OC symptoms

Relevance of responsibility in OC symptoms.

The relevance of responsibility in OC was investigated by 1) using Spearman's rho correlations (see Table 1); 2) controlling for intolerance of uncertainty and GA; and 3) controlling for intolerance of uncertainty, GA and anxiety and depression scores. Two hierarchical regressions were then conducted in which OC was the dependent variable. In the first one (see Table 2), intolerance of uncertainty and GA were entered at step 1, and the results showed that they accounted for 24.2% of the variance. At step 2, responsibility accounted for an additional and significant 3.2% of the variance. In the second regression, anxiety and depression scores were entered in step 2 and accounted for an additional 6.3% of the variance. At step 3, when entered last, responsibility still accounted for a significant 2.0% of the variance. Thus, according to the definition used in the introduction, responsibility was confirmed as a relevant variable in OC using lax (Spearman's rho correlations), moderate (separating intolerance of uncertainty and GA), and stringent (separating intolerance of uncertainty, GA, anxiety and depression) tests. The tolerance statistics showed that there was no multicollinearity.

Narrow specificity of responsibility in OC symptoms in relation to GA symptoms.

A similar approach was used to examine the relationship between responsibility and GA. Because the relevance of responsibility was previously demonstrated, the lack of an association between responsibility and GA under the same conditions would indicate the narrow specificity of responsibility in OC in relation to GA. Two hierarchical regression analyses were then conducted in which GA was the dependent variable. In the first one (see Table 2), intolerance of uncertainty and OC were entered at step 1, and the results showed that they accounted for 36.9% of the variance. At step 2, responsibility accounted for an additional and nonsignificant 0.9% of the variance. In the second regression, anxiety and depression scores were entered in step 2 and accounted for an additional 11.2% of the variance. At step 3, when entered last, responsibility accounted for a non-significant 0.02% of the variance. Thus, according to the definition used in the introduction, responsibility was confirmed as a specific variable in OC, using moderate (separating intolerance of uncertainty and OC) and stringent (separating intolerance of uncertainty, OC, anxiety and depression) tests alone, when testing the relationship between responsibility and GA. In this analysis, tolerance statistics also showed that there was no multicollinearity.

Please insert Tables 2 and 3 here

Narrow specificity of intolerance of uncertainty in GA symptoms

Relevance of intolerance of uncertainty in GA symptoms.

Similar to the approach used in relation to responsibility, the relevance of intolerance of uncertainty was investigated by 1) Spearman's rho correlations (see Table

1); 2) controlling for responsibility and OC; and 3) controlling for responsibility, OC and anxiety and depression scores. Two hierarchical regressions were conducted in which GA was the dependent variable. In the first one (see Table 3), responsibility and OC were entered at step 1, and the results showed that they accounted for 23.6% of the variance. At step 2, intolerance of uncertainty accounted for an additional and significant 14.2% of the variance. In the second regression, anxiety and depression scores were entered at step 2 and accounted for an additional 20.1% of the variance. At step 3, when entered last, intolerance of uncertainty still accounted for a significant 4.6% of the variance. Thus, according to the definition used in the introduction, intolerance of uncertainty was confirmed as a relevant variable in GA using lax (zero-order), moderate (separating responsibility and OC), and stringent (separating responsibility, OC, anxiety and depression) tests. The analyses still showed no signs of multicollinearity.

Narrow specificity of intolerance of uncertainty in GA symptoms in relation to OC behavior.

A similar procedure was used to examine the relationship between intolerance of uncertainty and OC. Because relevance had been previously demonstrated, the lack of an association between intolerance of uncertainty and OC under the same conditions would indicate the narrow specificity of intolerance of uncertainty in GA in relation to OC. Two hierarchical regression analyses were then conducted in which OC was the dependent variable. In the first one (see Table 3), responsibility and GA were entered at step 1, and the results showed that they accounted for 23.6% of the variance. At step 2, intolerance of uncertainty accounted for an additional and significant 3.8% of the variance. In the second regression, anxiety and depression scores were entered at step 2

and accounted for an additional 7.4% of the variance. At step 3, when entered last, intolerance of uncertainty accounted for a significant 1.5% of the variance. Thus, according to the definition used in the introduction, intolerance of uncertainty was not confirmed as a specific variable in GA, using lax (zero-order), moderate (separating responsibility and OC), and stringent (separating responsibility, OC and anxiety and depression) tests. The analyses showed no signs of multicollinearity.

Discussion and conclusions

The aim of this study was to better specify the nature of the relationship between responsibility and OC and the relationship between intolerance of uncertainty and GA. To this end, we first assessed whether responsibility and intolerance of uncertainty were relevant in OC and GA, respectively, even when considering other variables that might have affected this relationship and using lax, moderate and stringent tests. Then, to establish whether responsibility and intolerance of uncertainty were specific to OC and GA, respectively, the second assessment was whether these variables were independent of GA and OC, respectively, even when considering other variables that might have affected this association and also using lax, moderate and stringent tests.

The results showed that responsibility was relevant and specific to OC, using both moderate and stringent tests; thus, hypotheses 1 and 2 received empirical support. However, the association between responsibility and OC symptoms was not strong. This finding was not surprising because the variance associated with the remaining four variables (intolerance of uncertainty, depression, anxiety, GA) that strongly correlated with OC (see Table 1) was simultaneously considered. These results are consistent with the findings of Salkovskis et al. (2000), the OCCWG, (2001, 2005), and Taylor et al.

(2006). However, to our knowledge, this is the first study to test the narrow specificity of responsibility in OC compared with GA following the guidelines established by Garber and Hollon (1991). Additionally, by controlling for possible confounding variables, such as negative emotions, these results increase the strength of the status of responsibility as a specific variable of OCD. In terms of Garber and Hollon's (1991) framework, these data support responsibility as being a central factor in OCD. This claim is relevant not only for theoretical but also for clinical reasons. The results of this study, taken together with the empirical research that proves that experimentally augmenting responsibility increases OC symptoms, support the role of responsibility as a crucial therapeutic target in the psychological treatment of some subtypes of OCD (Cougles, Lee, & Salkovskis, 2007). This finding does not mean that other important therapeutic variables must be ruled out, but it highlights the importance of responsibility.

Regarding intolerance of uncertainty, the results showed that it was relevant to GA using both moderate and stringent tests. However, the results did not support the hypothesis that intolerance of uncertainty was specific to GA, with either moderate or stringent tests. Therefore, hypothesis 3 received empirical support, but hypothesis 4 did not. These results are consistent with the meta-analysis published by Gentes and Ruscio (2011) and other studies. Similar to responsibility, to our knowledge, this is the first study that follows the recommendations of Garber and Hollon (1991) to test the narrow specificity of intolerance of uncertainty in GA in comparison with OC. Following Garber and Hollon's (1991) terminology, the results of this study do not support the narrow specificity of intolerance of uncertainty in GA in relation to OC; therefore, this variable is ruled out as a sufficient cause of GA. However, these results cannot exclude

the possibility that intolerance of uncertainty is a key component of a multivariate model (Garber & Hollon, 1991), such as the one proposed by Dugas et al. (1998, 2005). Furthermore, regression analyses revealed a model that predicted GA with 3 variables: intolerance of uncertainty, depression, and anxiety³. These three variables had a moderate but relevant association with GA. In addition to the theoretical implications of these results, they are relevant for clinical reasons. Taken together with those results that support the importance of intolerance of uncertainty in OCD (Holaway et al., 2006; Tolin et al., 2003) and in panic disorder (Carleton et al., 2014), these results show that intolerance of uncertainty appears to be best conceptualized as a continuum variable that is important, to different degrees, in a number of psychological disorders (Carleton et al., 2012). It might be difficult to find a specific cognitive construct for GAD because, as some authors argue, the disorder could be the more generalized presentation. However, this complexity does not downplay the constructs that form different models of the disorder.

One of the limitations of this study is that it was conducted using a sample of university students and consequently the results cannot be directly generalized to clinical settings. However, all current cognitive models of anxiety disorders are based on the assumption that there are quantitative, rather than qualitative, differences between patients' symptoms and similar behaviors found in nonclinical samples (Abramowitz et al., 2014; Gibbs, 1996). Another limitation regarding the sample used is that it was mainly composed of women. However, there is no data in the literature that suggests significant differences between men and women in intolerance of uncertainty

³ After all variables that predicted GA were introduced, responsibility (Beta = .055; $t = 1.134$; $p = .258$) and OC (Beta = .020; $t = .420$; $p = .675$) were not statistically significant.

or responsibility. The last limitation concerning the sample is the generalization of these results to other cultures. Because this study was performed in a Spanish sample, cultural particularities regarding OCD must be considered. Sica et al. (2006), among others, noted the cultural differences in OCD samples from different countries. However, to the extent that the measures used in this research have been validated in Spanish populations, and their factorial structures and psychometric properties are similar to the English versions, we understand that the concepts assessed are similar.

An additional important question is whether the RAS and IUS measure exactly the same constructs in the same way in clinical and non-clinical samples; this topic has been barely studied, but see Carleton et al., 2012 for their results on the IUS. Despite these limitations, we consider that these results provide some suggestions regarding what may occur in the clinical population.

These findings are obviously limited by the measures used. The use of BDI instead of BDI-II is the first limitation concerning the measures. At the time the data was collected, the Spanish version of the BDI-II was not very extended, so the first version of this questionnaire was used. The intolerance of uncertainty measure used (IUS) was developed in the context of the GAD theory proposed by Dugas et al. (1998, 2005). The responsibility measure used (RAS) was developed in the context of the OCD theory proposed by Salkovskis (1985, 1999). Thus, we believe that both measures are appropriate for testing our hypotheses. Nevertheless, responsibility and intolerance of uncertainty may present different forms in these disorders (Anderson et al., 2012; Gentes & Ruscio, 2011). Additionally, current measures differentially address common or specific features of responsibility and intolerance of uncertainty (Anderson et al., 2012; Birrell, Meares, Wilkinson, & Freeston, 2011; Gentes & Ruscio, 2011) in OCD

and GAD. Finally, it would also be interesting to conduct a similar study taking into account OCD subtypes, given that some studies suggest that GAD may have more characteristics in common with checking than with any other OCD subtypes (Tallis & de Silva, 1992). In fact, Taylor et al. (2010) have found that some cognitive variables are strongly related to some, but not all, OCD subtypes. Future studies could also take into account other cognitive variables relevant to GAD—such as those proposed in the model by Dugas and colleagues (e.g., cognitive avoidance, poor problem-solving orientation, and beliefs about worries; Dugas et al., 1998, 2005)—or relevant to OCD, such as those proposed by the OCCWG (e.g., perfectionism and the importance of thoughts and their control; OCCWG, 1997).

In conclusion, our results suggest that responsibility is relevant and specific to OC in relation to GA, and intolerance of uncertainty is relevant but non-specific to GA in relation to OC. The validity of these suggestions in clinical samples, however, should be determined in future studies.

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Table 1.

Descriptive statistics and correlations (Spearman's Rho) between variables.*

Variables	<i>M</i>	<i>SD</i>	Minimum	Maximum	Correlations				
					WAQ	RAS	IUS	BDI	BAI
Y-BOCS	8.30	6.27	0	28	.38	.38	.45	.40	.44
WAQ	36.62	17.79	0	71		.40	.59	.61	.57
RAS	98.81	21.43	34	166			.51	.40	.37
IUS	60.46	17.07	27	117				.53	.51
BDI	6.93	5.95	0	34					.59
BAI	9.82	8.16	0	58					

Note. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; WAQ = Worry and Anxiety Questionnaire; RAS = Responsibility Attitudes Questionnaire; IUS = Intolerance of Uncertainty Scale; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.

* All correlations are statistically significant ($p < .01$).

Table 2.

*Specificity of responsibility in OC: Regression equations.*Testing the relevance of responsibility in OC¹.

Eq.	Step	Variable	ΔR^2	F	Beta	t	p.	CIs		Tol.
								LL	UL	
1	a	IUS	.242	52.279	.350	5.882	.000	.086	.173	.652
		WAQ			.196	3.284	.001	.028	.111	.652
	b	RAS	.032	41.059	.212	3.789	.000	.030	.094	.709
2	a	See 1a								
	b	BDI	.063	35.710	.194	3.044	.003	.073	.341	.524
		BAI			.200	3.321	.001	.063	.247	.588
	c	RAS	.020	31.248	.170	3.102	.002	.018	.081	.691
Testing the specificity of responsibility in OC, compared with GA ² .										
1	a	IUS	.369	95.816	.514	10.372	.000	.435	.639	.783
		Y-BOCS			.163	3.284	.001	.184	.732	.783
	b	RAS	.009	66.093	.112	1.335	.182	-.022	.114	.688
2	a	See 1a								
	b	BDI	.112	75.419	.284	5.291	.000	.535	1.169	.553
		BAI			.214	4.156	.000	.246	.689	.599
	c	RAS	.002	60.645	.055	1.134	.258	-.033	.124	.674

Note. ¹Dependent variable = OC. ²Dependent variable = GA. Eq = regression equation; CIs = confidence interval; LL = lower limit; UL = upper limit; Tol. = tolerance; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; WAQ = Worry and Anxiety Questionnaire; RAS = Responsibility Attitudes Questionnaire; IUS = Intolerance of Uncertainty Scale; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.

Table 3.

*Specificity of IU in GA: Regression equations.*Testing the relevance of IU in GA¹.

Eq.	Step	Variable	ΔR^2	F	Beta	t	p.	CIs		Tol
								LL	UL	
1	a	RAS	.236	50.557	.299	5.631	.000	.160	.332	.828
		Y-BOCS			.278	5.245	.000	.489	1.077	.828
	b	IUS	.142	66.093	.467	8.632	.000	.376	.598	.651
2	a	See 1a								
	b	BDI	.201	63.114	.356	6.577	.000	.749	1.388	.590
		BAI			.262	4.951	.000	.344	.799	.618
	c	IUS	.046	60.645	.291	5.390	.000	.193	.415	.546
Testing the specificity of IU in GA, compared with OC ² .										
1	a	RAS	.236	50.691	.300	5.651	.000	.057	.118	.828
		WAQ			.278	5.245	.000	.062	.136	.828

	b	IUS	.038	41.059	.259	4.109	.000	.050	.142	.558
	a	See 1a								
2	b	BDI	.074	36.552	.205	3.270	.001	.087	.350	.538
		BAI			.209	3.505	.001	.071	.253	.597
	c	IUS	.015	31.248	.171	2.690	.008	.017	.110	.513

Note. ¹Dependent variable = GA. ²Dependent variable = OC. Eq = regression equation; CIs = confidence interval; LL = lower limit; UL = upper limit; Tol. = tolerance; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; WAQ = Worry and Anxiety Questionnaire; RAS = Responsibility Attitudes Questionnaire; IUS = Intolerance of Uncertainty Scale; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.