



## Excessive reassurance seeking and anxiety pathology: Tests of incremental associations and directionality

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### ABSTRACT

Excessive reassurance-seeking (ERS) is hypothesized to play a key role in emotional disorders but has been studied mostly in relation to depression. Study 1 reports a new measure of reassurance seeking that assessed ERS related to general and evaluative threats in a non-clinical student sample, and its factor structure was further examined in Study 2. In Study 3, the scale, along with other symptom-related measures and an existing measure of depressive ERS, was administered to an undergraduate sample at two different time points, one month apart. Greater ERS was associated with greater symptoms of social anxiety, generalized anxiety disorder, and obsessive–compulsive disorder (OCD), even after controlling for trait anxiety, depression, and intolerance of uncertainty. Among OCD symptoms, only thoughts of harm were uniquely related to ERS, a finding consistent with emerging literature. ERS involving general threats also predicted changes in social anxiety and GAD symptoms one month later. Overall, the findings implicate an important role for ERS across anxiety disorders.

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### 1. Introduction

Anxiety disorders constitute a significant public health burden. Recent epidemiological evidence suggests they are much more prevalent than traditionally thought, affecting up to half of the general population (Moffitt et al., 2010). They also generally maintain a chronic course when left untreated (Pine, Cohen, Gurley, Brook, & Ma, 1998) and result in substantial impairment across the lifespan (Ferdinand, van der Reijden, Verhulst, Nienhuis, & Giel, 1995). It is therefore noteworthy that cognitive-behavioral therapy (CBT) has demonstrated impressive effectiveness in the treatment of anxiety disorders, with rates of improvement ranging from 60 to 90% (Norton & Price, 2007). The rise of CBT in the treatment of anxiety disorders has led to the development of many disorder-specific treatment protocols. This development has been viewed as problematic by some who criticize it for being inefficient and as negatively impacting treatment dissemination (Barlow, Allen, & Choate, 2004; Cogle, in press).

An approach to developing more efficient and parsimonious therapies is to focus on core processes occurring across anxiety

disorders. One transdiagnostic process is safety behavior; safety behaviors are actions intended to avoid or cope with perceived threat (Salkovskis, Clark, & Gelder, 1996). They may take different forms depending on the anxiety disorder. For example, individuals with social anxiety disorder may grip objects tightly to avoid shaking while reading to a group or rehearse sentences in their mind and speak quickly to counter the fear of talking inappropriately (Wells et al., 1995). Individuals with panic disorder may carry safety aids such as a cell phone, water, or medication, or check for exits and restrooms (Rachman, 1984). There is evidence to suggest that safety behaviors are important maintaining factors in anxiety disorders (Helbig-Lang & Petermann, 2010). They may act to prevent threat disconfirmation through misattribution of safety to the safety behavior itself rather than the harmless nature of the stimulus or situation. Safety behaviors may also tax attentional resources that would be necessary to attend to and process disconfirming information (Sloan & Telch, 2002). Additionally, safety behaviors may actually exacerbate anxiety symptoms and lead to threat overestimation (Deacon & Maack, 2008), perhaps by focusing excessive attention on perceived threats.

#### 1.1. Excessive reassurance seeking

One form of safety behavior that has received some research attention is excessive reassurance seeking (ERS). It has been

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discussed extensively in relation to health anxiety (e.g., seeking reassurance from health professionals) and plays a central role in cognitive models of this disorder (Salkovskis & Warwick, 1986). It has also been described in patients with generalized anxiety disorder (GAD) (Woody & Rachman, 1994). ERS related to general threats and social threats was also found in an interview-based study of obsessive-compulsive disorder (OCD) patients (Parrish & Radomsky, 2010). It was also more likely to be endorsed as a strategy used for coping with negative intrusions among individuals with OCD compared to depressed individuals and anxious and non-clinical controls (Morillo, Belloch, & García-Soriano, 2007). Rachman (2002) hypothesized that, for compulsive checkers, ERS is used to reduce anxiety, prevent harm, and decrease responsibility for harm.

Most psychopathology-related research on ERS has been conducted in relation to depression (e.g., Joiner & Metalsky, 2001). According to Coyne's (1976) interpersonal theory, the individual with depression has a tendency to seek reassurance to alleviate doubts that other people truly care about them. Others may provide reassurance, but the depressed individual doubts their sincerity. Reassurance seeking continues, assurance is given but doubted, and a negative spiral results. Those who are close to the depressed individual become increasingly likely to reject him or her, which further disrupts the depressed person's environment and maintains or exacerbates his or her symptoms.

The type of ERS described above has been found to predict future depressive symptoms (Joiner & Metalsky, 2001) and depressive, but not anxious, reactions to acute stress (Joiner & Schmidt, 1998). It has been given little consideration in relation to symptoms of different anxiety disorders. Further, ERS investigated across these studies does not consider the threat-related nature of reassurance-seeking that is often reported by individuals with anxiety disorders. When assessing the role of ERS in anxiety disorders, additional motivations and contexts that may drive such behavior are important to consider, especially threat-related motivations. Thus, in order to better understand ERS and anxiety pathology, our first study focuses on assessing ERS in a manner that includes threat-related motivations.

### 1.2. Why is ERS related to anxiety?

Several explanations could account for relations between ERS and anxiety pathology. First, ERS might be a consequence of anxiety pathology. According to this view, the anxious individual seeks the assurance of others that danger is not imminent and situations or stimuli are safe. Such behavior may be carried out to reduce anxiety and risk of harm. Second, ERS and anxiety may be related because of their joint association with depressive symptoms (Joiner & Schmidt, 1998). Third, anxious individuals may also engage in ERS to reduce unbearable feelings of uncertainty; thus, ERS may simply be a consequence of intolerance of uncertainty. Intolerance of uncertainty has been implicated as an important construct in anxiety pathology and figures prominently in cognitive conceptualizations of GAD (Dugas, Gosselin, & Ladouceur, 2001). Greater intolerance of uncertainty has also been linked to OC checking (Tolin, Abramowitz, Brigidi, & Foa, 2003) and social anxiety (Boelen & Reijntjes, 2009). Finally, it is possible that ERS plays a maintaining or causal role in anxiety pathology. It may function similarly to other safety behaviors in that it prevents threat disconfirmation (Salkovskis, 1991). ERS may also contribute to anxious symptoms by focusing increased attention on perceived threat and decreasing self-confidence to cope with perceived threats.

It is difficult to choose among the possible explanations described above because of important gaps in the literature regarding the role of ERS in anxiety pathology. To date, ERS has been described among different clinical groups, but it has been assessed

quantitatively primarily in the context of health-related behaviors specific to hypochondriasis (Salkovskis, Rimes, Warwick, & Clark, 2002). Its unique relations with other forms of anxiety pathology have not been explored. Rival constructs that may explain the proposed relations between ERS and anxiety pathology, including depression and intolerance of uncertainty, have been given little consideration. In addition, the directionality of the ERS and anxiety association and the potential role of ERS in predicting future anxiety pathology have not been tested.

Based on clinical reports and existing theory and research (e.g., Parrish & Radomsky, 2010; Rachman, 2002; Salkovskis & Warwick, 1986), we propose that two additional forms of ERS may be related to anxiety pathology. The first type of ERS, related to general threats, is carried out to receive assurance from others that negative outcomes will not occur. The second type is more self-focused and evaluative in nature and is carried out so that the individual is assured that others do not think negatively of him or her. We hypothesize that the first type is prevalent across anxiety disorders and the second type is more central to social anxiety disorder.

The current research sought to clarify the role of ERS in anxiety pathology. Specifically, it had four separate aims: (1) to develop a means of assessing reassurance-seeking related to general threats and threats of negative evaluation; (2) to examine the associations of multiple reassurance-seeking dimensions, including depressive reassurance seeking, with self-report measures of GAD, social anxiety, and OCD; (3) to examine whether depressive symptoms, trait anxiety, and intolerance for uncertainty account for the relations between ERS and anxiety disorder symptoms; and (4) to test whether ERS tendencies predict anxiety disorder symptoms prospectively and vice versa. We also conducted exploratory analyses of the role of gender in moderating the reassurance seeking and anxiety pathology relationship.

## 2. Study 1

In order to investigate the proposed transdiagnostic core process, a means of assessing threat-related reassurance seeking was needed. Towards this end, 10 items assessing reassurance-seeking behavior involving general and evaluative threats were devised and evaluated.

### 2.1. Methods

#### 2.1.1. Participants

Participants were 121 students (80.2% female) enrolled in an introductory psychology course. Since this class meets university liberal studies requirements in social sciences, students potentially represent all colleges and majors on campus. Participants ranged in age from 18 to 29 ( $M = 18.98$ ,  $SD = 1.5$ ) and consisted of diverse ethnic groups: Caucasian (71.1%), African American (14.0%), Hispanic (13.2%), Asian/Pacific Islander (2.5%), and other (3.2%).

#### 2.1.2. Procedure

Participants registered for a testing session through the psychology department's secure and confidential electronic research sign-up database. After participants read and signed the consent form, they completed the initial 10-item Threat-related Reassurance Seeking Scale (TRSS; author-constructed), which was part of a larger study addressing many research questions related to personality and psychopathology. This study took approximately two hours to complete.

**Table 1**  
Study 1 – rotated factor matrix of the initial version of the TRSS.

	Factor 1	Factor 2
1. Do you find yourself often asking others whether everything will be alright?	0.37	<b>0.65</b>
2. Do you find yourself often asking others whether there is something wrong with you (for example, your appearance, behavior, personality, or intelligence)?	<b>0.80</b>	0.35
3. Do people sometimes get “fed up” with you for seeking reassurance from them about whether something bad is going to happen?	0.55	0.57
4. If you suspect there might be something wrong with you (for example, your appearance, behavior, personality, or intelligence), do you seek reassurance from others?	<b>0.80</b>	0.22
5. Do you frequently seek reassurance from others as to whether something bad is going to happen?	0.41	<b>0.72</b>
6. Do people sometimes get “fed up” with you for seeking reassurance from them about whether there is something wrong with you (for example, your appearance, behavior, personality, or intelligence)?	0.71	0.50
7. If you suspect something bad might happen, do you seek reassurance from others?	0.20	<b>0.74</b>
8. Do you need reassurance from others that everything will be alright?	0.30	<b>0.75</b>
9. Do you frequently seek reassurance from others as to whether there is something wrong with you (for example, your appearance, behavior, personality, or intelligence)?	<b>0.78</b>	0.34
10. Do you need reassurance from others that there is nothing is wrong with you (for example, your appearance, behavior, personality, or intelligence)?	<b>0.79</b>	0.43
% of variance explained	37.5	30.7

Note: Factor 1 represents evaluative threat and Factor 2 represents general threat. Final subscale items have factor loadings highlighted in bold.

## 2.2. Measures

### 2.2.1. Threat-related Reassurance Seeking Scale (TRSS)

The TRSS comprised 10 questions that were generated to assess reassurance-seeking behavior related to general and evaluative threat with five items included to assess each of the two dimensions (see Table 1). These items were created through consultation with two senior clinical researchers, one of whom has published extensively on depressive excessive reassurance seeking. The introduction to the measure was very brief: “For the following questions, please select the answer most appropriate to you. Please be sure to answer all questions.” Respondents answered each question on a seven point scale, ranging from 1 (No, not at all) to 7 (Yes, very much). The response scale was identical to that used in the Depressive Interpersonal Relationships Inventory (DIRI; Metalsky et al., 1991). In addition, some of the TRSS items included similar wording to the reassurance-seeking subscale of the DIRI, though their reassurance-seeking subscale was concerned with whether close friends cared about the individual. Copies of the TRSS are available from the corresponding author.

## 2.3. Results

Principal axis factoring was carried out with varimax rotation. Rotated factor matrix and factor loadings for each item are presented in Table 1. Items loading on multiple factors were eliminated. This led to the elimination of two items, #3 and 6. Eight items displaying distinctive factor loadings above 0.50 were retained for the final version of the TRSS. The chosen eight items were again subjected to principal axis factoring with varimax rotation. The two-factor solution was replicated using the eight items. The two factors explained 69.0% of the total variance (37.2% and 31.8%, respectively). Factor 1 (item #2, 4, 9, 10) pertained to reassurance-seeking related to evaluation, and Factor 2 (item #1, 5, 7, 8) pertained to reassurance-seeking related to general threat. Cronbach’s alpha was 0.92 for the total 8-item scale, and 0.86 and 0.85 for Factor 1 (i.e., evaluative threat) and Factor 2 (i.e., general threat), respectively.

## 3. Study 2

Study 1 yielded promising findings regarding a two dimensional assessment of reassurance-seeking. However, the findings need to be cross validated, thus the goal of Study 2 was to provide this information by testing the factor structure of the TRSS in a new sample.

## 3.1. Methods

### 3.1.1. Participants

Participants were 243 students (75.3% female) enrolled in an introductory psychology course. Participants ranged in age from 18 to 38 ( $M=19.33$ ,  $SD=1.93$ ) and consisted of diverse ethnic groups: Caucasian (69.1%), Hispanic (16.9%), African American (8.6%), Asian/Pacific Islander (2.1%), and other (3.3%).

### 3.1.2. Procedure

The procedures of this study were identical to those of Study 1.

## 3.2. Measures

### 3.2.1. Threat-related Reassurance Seeking Scale (TRSS)

The final 8-item version of the TRSS developed in Study 1 was administered to participants.

## 3.3. Confirmatory factor analysis

Confirmatory factor analysis (CFA) of the TRSS was conducted employing Mplus, Version 6.1 (Muthén & Muthén, 2010). We examined several fit indices, including the Comparative Fit Index (CFI; Bentler, 1990), the Tucker–Lewis Index (TLI; Tucker & Lewis, 1973), the Standardized Root Mean Square Residual (SRMR; Hu & Bentler, 1999), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993). CFI and TLI values greater than or equal to 0.95 and SRMR values less than 0.08 are indicative of good fit (Hu & Bentler, 1999). RMSEA values less than 0.05 are indicative of good fit and values between 0.05 and 0.08 are indicative of a reasonable fit (Browne & Cudeck, 1992).

Two latent factors were specified based on the results of Study 1: (1) reassurance-seeking related to evaluative threat (item #2, 4, 9, 10) and (2) reassurance-seeking related to general threat (item #1, 5, 7, 8) as shown in Table 1. The latent factors were permitted to covary and the measurement model was fit to the data,  $\chi^2(19)=54.37$ ,  $p<0.001$ , CFI=0.97, TLI=0.96, SRMR=0.03, and RMSEA=0.09. Evaluating localized areas of strain in the model, showed that there was evidence of correlated error residuals between items 5 and 8. As the content of these items is overlapping (“Do you frequently seek reassurance from others as to whether something bad is going to happen?” and “Do you need reassurance from others that everything will be alright?”), we modified the measurement model to allow the error covariance between these items to be freely estimated,  $\chi^2(18)=38.71$ ,  $p<0.01$ , CFI=0.98, TLI=0.98, SRMR=0.03, and RMSEA=0.07. The  $\chi^2$  difference test,

$\chi^2(1) = 15.66, p < 0.001$ , indicated that this respecified model fit the data significantly better than the original model.

We also tested the goodness-of-fit of a one-factor solution as an alternative model. The fit indices showed that the fit of this model was poor,  $\chi^2(20) = 140.46, p < 0.001$ , CFI = 0.91, TLI = 0.87, SRMR = 0.06, and RMSEA = 0.16. When testing a measurement model that allowed error covariance between items 5 and 8 to be freely estimated as done in the two-factor model above, we determined that the fit of the modified measurement model remained poor,  $\chi^2(19) = 133.65, p < 0.001$ , CFI = 0.91, TLI = 0.87, SRMR = 0.06, and RMSEA = 0.16.

To examine further whether a two-factor model is more appropriate than a unidimensional model, a model comparison procedure introduced by Bollen (1980) was used. By comparing the two-factor model to a model where the zero-order association between the two dimensions of reassurance seeking is constrained to be one (thereby positing a single factor), two- and one-factor models can be compared directly by interpreting the change in chi-square (per change in degrees of freedom) as a chi-square statistic. When the association between reassurance seeking dimensions was constrained to unity, there was a poor fit to the data as described above,  $\chi^2(19) = 133.65, p < 0.001$ . Allowing the dimensions to covary resulted in a significant change in chi-square for a one degree of freedom change,  $\chi^2(1) = 94.94, p < 0.001$ , indicating that the modified two factor model had a significantly better fit to the data than the modified one factor model.

#### 4. Study 3

The goal of Study 3 was to assess the reliability of the TRSS in a new sample that was assessed at two different time points, one month apart. We also sought to test the associations between the TRSS and a measure of depressive reassurance-seeking and symptoms of GAD, social anxiety, and OCD, after covarying for trait anxiety and depression. We also examined whether the relations between the TRSS and anxiety symptoms could be accounted for by a self-report measure of intolerance of uncertainty. Finally, we addressed issues of directionality by testing the temporal associations between TRSS and anxiety symptoms.

##### 4.1. Methods

###### 4.1.1. Participants

Participants were 173 students (81.5% female) enrolled in an introductory psychology course. Participants ranged in age from 18 to 34 ( $M = 18.8, SD = 2.39$ ) and consisted of diverse ethnic groups: Caucasian (69.4%), African American (11.5%), Hispanic (12.7%), Asian/Pacific Islander (4.5%), and other (1.9%).

###### 4.1.2. Procedure

Participants registered for a testing session through the psychology department's secure and confidential electronic research sign-up database. After participants read and signed the consent form, they completed the self-report measures in a group setting of approximately 10–30 individuals. In exchange for their participation, participants received class research credit. One month later, participants returned to complete the same measures in the same setting.

##### 4.2. Measures

###### 4.2.1. Threat-related Reassurance Seeking Scale (TRSS)

The final 8-item version of the TRSS developed in Study 1 was administered to participants.

###### 4.2.2. Depression Interpersonal Relationships

###### *Inventory-Reassurance Seeking (DIRI-RS) subscale*

The 4-item reassurance seeking subscale from the DIRI (Metalsky et al., 1991) was included to demonstrate the convergent validity of the TRSS and to assess the relations between depressive ERS and anxiety pathology. The subscale has been found to predict observer-rated reassurance-seeking behavior (Joiner & Metalsky, 2001) and showed excellent internal consistency in the current study ( $\alpha = 0.90$ ).

###### 4.2.3. Beck Depression Inventory (BDI-II)

The BDI-II is a self-report measure composed of 21 items that assess depressive symptomatology (Beck, Steer, & Brown, 1996). This measure has been shown to be valid and reliable among college and clinical samples (Dozois, Dobson, & Ahnberg, 1998; Steer & Clark, 1997), has demonstrated good discriminative validity (Riskind, Beck, Brown, & Steer, 1987), and showed good internal consistency in the present sample ( $\alpha = 0.91$ ).

###### 4.2.4. Intolerance for Uncertainty Scale (IUS)

The IUS is a 27-item self-report measure assessing the extent to which the respondent considers uncertainty as unacceptable, results in stress and frustration, and reflects badly on oneself (Buhr & Dugas, 2002). Items are rated on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The IUS showed excellent internal consistency ( $\alpha = 0.95$ ) in the present sample and appropriate convergent and divergent validity when tested with measures of worry, depression and anxiety (Buhr & Dugas, 2002).

###### 4.2.5. Liebowitz Social Anxiety Scale Self Report (LSAS-SR) Version

The LSAS is a self-report measure consisting of 24-items scales assessing levels of intensity of fear/anxiety and frequency of avoidance of various social situations (Liebowitz, 1987). The LSAS showed good internal consistency ( $\alpha = 0.94$ ) in the present sample and has demonstrated excellent convergent validity in comparison to other commonly used measures of social anxiety (Heimberg et al., 1999).

###### 4.2.6. Padua Inventory (PI)-Washington State University Revision

The Padua Inventory is a 39-item self-report measure that assesses obsessions and compulsions (Burns, 1995). Each item is rated on a 5-point scale according to the degree of disturbance caused by the thought or behavior, from 0 (not at all) to 4 (very much). The Padua Inventory has demonstrated good internal consistency ( $\alpha = 0.94$  in the present sample) and reliability (Burns, Keortge, Formea, & Sternberger, 1996).

###### 4.2.7. Penn State Worry Questionnaire (PSWQ)

The PSWQ is a self-report measure consisting of 16 items that assess an individual's general tendency to engage in excessive worry (Meyer, Miller, Metzger, & Borkovec, 1990). Individuals indicate the extent to which each statement is applicable to them on a five-point Likert scale from 1 (not at all) to 5 (very). The PSWQ showed appropriate internal consistency in the present sample ( $\alpha = 0.94$ ).

###### 4.2.8. State Trait Anxiety Inventory-Trait (STAI-T) version

The STAI-T is a 20-item self-report measure assessing trait anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The STAI-T demonstrated good internal consistency ( $\alpha = 0.91$ ) in the present sample.

**Table 2**  
Descriptives for Study 3 measures and comparisons between genders.

	Males (n = 32)		Females (n = 141)		Total (n = 173)		Group comparisons
	Mean	SD	Mean	SD	Mean	SD	
TRSS	16.78	8.52	25.20	12.01	23.64	11.88	F = 14.09, p < 0001
TRSS-G	8.00	4.30	12.67	6.21	11.81	6.16	F = 16.34, p < 0001
TRSS-E	8.78	4.76	12.52	6.76	11.83	6.59	F = 8.80, p < 005
DIRI-RS	7.66	4.74	10.69	6.11	10.13	5.99	F = 6.92, p < 01
PI	13.19	13.02	21.31	17.30	19.80	16.86	F = 6.23, p < 02
LSAS	25.34	18.72	34.06	17.50	32.35	18.02	F = 6.21, p < 02
PSWQ	39.91	12.98	50.89	14.24	48.86	14.62	F = 16.02, p < 0001
IUS	49.34	15.80	56.84	18.16	55.45	17.94	F = 4.65, p < 04
STAI-T	31.38	9.70	39.09	9.70	37.66	10.66	F = 14.73, p < 0001
BDI-II	6.75	8.80	9.28	8.26	8.81	8.40	F = 2.38, p = 0.13

TRSS = threat-related reassurance seeking; TRSS-G = general threat-related reassurance seeking; TRSS-E = evaluative threat-related reassurance seeking; DIRI-RS = Depressive Interpersonal Relationships Inventory-Reassurance Seeking; PI = Padua Inventory; LSAS = Liebowitz Social Anxiety Scale; PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale; STAI-T = State Trait Anxiety Inventory-Trait version; BDI-II = Beck Depression Inventory-II.

4.3. Results

4.3.1. Item validity and internal consistency

Internal-consistency and item-total correlations of the TRSS were examined. The corrected item-total correlations ranged from 0.68 to 0.84, suggesting adequate item validity. Cronbach's alpha was 0.93 for the total scale, and 0.93 and 0.89 for Factor 1 (i.e., evaluative threat) and Factor 2 (i.e., general threat), respectively.

4.3.2. Test-retest reliability

Test-retest reliability estimates were based on students who completed the TRSS at two different time points, one month apart (n = 173). Reliability estimates were calculated using Pearson r between scores on the first and second administration. Overall, the total scale score (r = 0.84, p < 0.0001) and both subscales (general: r = 0.80, p < 0.0001; evaluative: r = 0.79, p < 0.0001) displayed good test-retest reliability.

4.3.3. Descriptives

The means and standard deviations for the total scale and two subscales are presented in Table 2. Overall, 19.5% of the sample scored in the clinical range for GAD symptoms (PSWQ = 65 or greater, Fresco, Mennin, Heimberg, & Turk, 2003) and 19% scored in the clinical range for social anxiety disorder symptoms (LSAS = 47 or greater, Rytwinski et al., 2009). We were unable to find recommended clinical cutoffs for the Padua Inventory. ANOVA tests revealed that women reported significantly greater reassurance seeking than men, and this was found for total scores, as well as scores on the general threat and evaluative threat subscales. Women also reported significantly greater scores than men on the

DIRI-RS, the Padua Inventory, the LSAS, the PSWQ, the IUS, and the STAI-T. No gender differences were found for BDI-II scores.

4.3.4. Relations between excessive reassurance-seeking and anxiety pathology

Correlation and partial correlation analyses (controlling for BDI-II and STAI-T scores) are presented in Table 3. Strong correlations were found between both TRSS subscales and depressive reassurance seeking (DIRI-RS) scores, which indicates appropriate convergent validity for the new measure. Overall, the findings also indicate significant positive correlations between greater reassurance-seeking and symptoms of OCD, social anxiety, GAD, trait anxiety, and depression. These associations were found for general, evaluative, and depressive types of reassurance seeking, and the relations between reassurance seeking and GAD, OCD, and social anxiety symptoms remained significant when controlling for depression and trait anxiety. Greater reassurance seeking was also correlated with greater intolerance of uncertainty.

Next, we tested whether each type of threat-related reassurance seeking was uniquely predictive of anxiety pathology and specifically whether evaluative reassurance-seeking would be more strongly related to social anxiety symptoms. We conducted a series of hierarchical regression analyses with BDI-II and STAI-T scores entered into the first step and TRSS-general and TRSS-evaluative subscales entered into the second step. LSAS, Padua Inventory, and PSWQ total scores were the dependent variables in three separate analyses, each of which are presented in Table 4. Findings indicated that only general threat-related reassurance seeking was uniquely predictive of OCD, social anxiety, and GAD symptoms. Similar analyses (not presented here) also revealed that when TRSS-general and DIRI-RS scores were entered simultaneously into regression

**Table 3**  
Correlation and partial correlation analyses (controlling for anxiety and depression) between reassurance-seeking and anxiety pathology and depression.

	TRSS	TRSS-G	TRSS-E	DIRI-RS	PI	LSAS	PSWQ	IUS	STAI-T
TRSS-G	0.93**								
TRSS-E	0.94**	0.74**							
DIRI-RS	0.83**	0.75**	0.79**						
PI	0.52** (0.30**) <sup>a</sup>	0.50** (0.30**)	0.46** (0.23**)	0.45** (0.19)*					
LSAS	0.48** (0.28**)	0.48** (0.29**)	0.42** (0.22**)	0.46** (0.25**)	0.41** (0.21**)				
PSWQ	0.56** (0.28**)	0.59** (0.34**)	0.46** (0.17)*	0.49** (0.16)*	0.51** (0.28**)	0.37** (0.10)			
IUS	0.61** (0.35**)	0.61** (0.37**)	0.53** (0.27**)	0.55** (0.26)*	0.58** (0.36**)	0.50** (0.28**)	0.59** (0.27**)		
STAI-T	0.55**	0.56**	0.48**	0.53**	0.45**	0.41**	0.65**	0.61**	
BDI-II	0.54**	0.48**	0.52**	0.56**	0.50**	0.43**	0.54**	0.60**	0.65**

TRSS = threat-related reassurance seeking; TRSS-G = general threat-related reassurance seeking; TRSS-E = evaluative threat-related reassurance seeking; DIRI-RS = Depressive Interpersonal Relationships Inventory-Reassurance Seeking; PI = Padua Inventory; LSAS = Liebowitz Social Anxiety Scale; PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale; STAI-T = State Trait Anxiety Inventory-Trait version; BDI-II = Beck Depression Inventory-II.

<sup>a</sup> Partial correlations after controlling for the STAI-T and BDI are presented in parentheses.

\* p < 0.05.

\*\* p < 0.01.

**Table 4**

Hierarchical regression analyses with general and evaluative threat-related reassurance seeking predicting anxiety pathology after controlling for depression and trait anxiety.

	$\Delta R^2$	F	B	p
Dependent variable: Liebowitz Social Anxiety Scale				
Step 1	0.21	21.64		<0.001
BDI-II			0.27	<0.005
STAI-T			0.23	<0.05
Step 2	0.07	7.48		<0.001
BDI-II			0.19	<0.05
STAI-T			0.10	ns
TRSS-G			0.28	<0.01
TRSS-E			0.06	ns
Dependent variable: Padua Inventory				
Step 1	0.28	33.10		<0.001
BDI-II			0.36	<0.001
STAI-T			0.22	<0.05
Step 2	0.07	8.78		<0.001
BDI-II			0.28	<0.01
STAI-T			0.09	ns
TRSS-G			0.27	<0.01
TRSS-E			0.07	ns
Dependent variable: Penn State Worry Questionnaire				
Step 1	0.44	67.60		<0.001
BDI-II			0.20	<0.01
STAI-T			0.52	<0.001
Step 2	0.06	10.94		<0.001
BDI-II			0.15	<0.05
STAI-T			0.38	<0.001
TRSS-G			0.34	<0.001
TRSS-E			-0.06	ns

Note: BDI = Beck Depression Inventory; STAI-T = State Trait Anxiety Inventory-Trait version; TRSS-G = general threat-related reassurance seeking; TRSS-E = evaluative threat-related reassurance seeking.

analyses, only TRSS-general scores were uniquely predictive of OCD, social anxiety, and GAD symptoms. Given these findings, we focused the remainder of our analyses only on the TRSS-general subscale.

We next sought to examine whether OCD, social anxiety, and GAD symptoms were uniquely related to general threat-related reassurance seeking. Using a hierarchical regression analysis, BDI-II and STAI-T scores were entered into Step 1, and Padua Inventory, LSAS, and PSWQ scores were entered into Step 2, while TRSS-general scores was used as the dependent variable. At Step 1, both the BDI-II and STAI-T predicted general reassurance seeking and together accounted for 34.8% of the variance ( $R^2 = 0.348$ ,  $F = 42.62$ ,  $p < 0.0001$ ). At Step 2, scores on the Padua Inventory ( $\beta = 0.17$ ,  $t = 2.33$ ,  $p < 0.03$ ), LSAS ( $\beta = 0.21$ ,  $t = 3.13$ ,  $p < 0.003$ ), and PSWQ ( $\beta = 0.27$ ,  $t = 3.31$ ,  $p < 0.002$ ) were all uniquely related to reassurance seeking and together accounted for an additional 12.5% of the variance in reassurance seeking ( $R^2 = 0.125$ ,  $F = 12.45$ ,  $p < 0.0001$ ). These findings indicate that each type of anxiety pathology is uniquely related to ERS.

Lastly, we tested which subscales of the Padua Inventory and LSAS were uniquely related to general threat-related reassurance seeking. We conducted two separate hierarchical regression analyses, with BDI-II and STAI-T scores entered into the first step in each analysis and TRSS-general scores used as the dependent variable. In the first analysis, we also entered Padua Inventory subscales into Step 2. At Step 2, the Padua Inventory subscales accounted for an additional 9.5% of the variance in TRSS-general scores ( $R^2 = 0.095$ ,  $F = 5.45$ ,  $p < 0.0002$ ). Among these subscales, only thoughts of harm scores were uniquely related to general reassurance seeking ( $\beta = 0.24$ ,  $t = 2.36$ ,  $p < 0.03$ ). In the second analysis, we entered the LSAS fear and avoidance subscales into Step

2. At Step 2, the LSAS subscales accounted for an additional 6.0% of the variance in TRSS-general scores ( $R^2 = 0.060$ ,  $F = 8.05$ ,  $p < 0.0005$ ). LSAS-avoidance subscale scores were uniquely predictive of general reassurance seeking ( $\beta = 0.26$ ,  $t = 2.37$ ,  $p < 0.02$ ), though LSAS-fear subscale scores were not ( $\beta = 0.02$ ,  $t = 0.20$ ,  $p = 0.85$ ).

#### 4.3.5. Excessive reassurance-seeking, intolerance for uncertainty, and anxiety pathology

We also examined whether intolerance for uncertainty accounted for the unique relations between general threat-related ERS and anxiety pathology. To do so, we conducted hierarchical regression analyses controlling for trait anxiety and depression (STAI-T and BDI-II). These two variables were entered on Step 1 in hierarchical regression analyses predicting LSAS, Padua Inventory, and PSWQ total scores. TRSS-general and IUS scores were entered into Step 2. At Step 2, the variables were found to predict an additional 7.6% of the variance in PSWQ scores ( $R^2 = 0.076$ ,  $F = 13.34$ ,  $p < 0.0001$ ), and both TRSS-general ( $\beta = 0.25$ ,  $t = 3.55$ ,  $p < 0.001$ ) and IUS ( $\beta = 0.17$ ,  $t = 2.18$ ,  $p < 0.04$ ) scores were uniquely predictive of PSWQ scores. TRSS-general ( $\beta = 0.24$ ,  $t = 2.67$ ,  $p < 0.01$ ) and IUS scores ( $\beta = 0.24$ ,  $t = 2.43$ ,  $p < 0.02$ ) were also both uniquely associated with LSAS scores ( $R^2 = 0.093$ ,  $F = 10.55$ ,  $p < 0.0001$ ), accounting for 9.3% additional variance. Lastly, TRSS-general ( $\beta = 0.20$ ,  $t = 2.57$ ,  $p < 0.02$ ) and IUS scores ( $\beta = 0.33$ ,  $t = 3.83$ ,  $p < 0.001$ ) were both uniquely predictive of Padua Inventory scores ( $R^2 = 0.118$ ,  $F = 16.55$ ,  $p < 0.0001$ ) and accounted for 11.8% additional variance in these scores. Overall, these findings indicate that ERS and intolerance for uncertainty are both uniquely related to anxiety pathology, and intolerance for uncertainty does not account for the relations between ERS and anxiety pathology.

#### 4.3.6. Test of the moderating role of gender

We also examined whether gender moderated the relations between ERS and anxiety pathology. We chose to confine our analyses to the TRSS-general subscale, given that this subscale but not the TRSS-evaluative subscale was uniquely associated with anxiety pathology. The analytic strategy was similar to that of previous analyses. PSWQ, LSAS, and Padua Inventory scores were the dependent variables in each hierarchical regression analysis. In Step 1, STAI-T and BDI-II scores were entered. Centered TRSS-general and gender variables were entered into Step 2, and the interaction term was entered into Step 3. No main effects of gender or interactions were found when examining predictors of LSAS and Padua Inventory scores. However, analyses of PSWQ scores revealed no main effect of gender in Step 2 and a significant gender  $\times$  TRSS-general interaction in Step 3 ( $\beta = -0.15$ ,  $t = -2.07$ ,  $p < 0.05$ ,  $R^2 = 0.012$ ,  $F = 4.27$ ,  $p < 0.05$ ). To explore this interaction we conducted follow-up tests of simple slopes. Analyses revealed that among women, greater TRSS-general scores was associated with greater PSWQ scores ( $\beta = 0.32$ ,  $t = 4.64$ ,  $p < 0.001$ ). However, among men, no association between TRSS-general and PSWQ scores was found ( $\beta = -0.08$ ,  $t = -0.42$ ,  $p = 0.68$ ).

#### 4.3.7. Prospective analysis of excessive reassurance seeking as a predictor of anxiety pathology

Regression analyses were then conducted to test whether TRSS scores predicted anxiety pathology one month later. The relevant symptom measure at Time 2 was used as the dependent variable in each analysis, with initial scores at Time 1 entered at Step 1 in each analysis along with Time 1 BDI-II and STAI-T scores. We focused on Time 1 TRSS-general scores, which were entered at Step 2. The findings from these analyses are presented in Table 5. Overall, these analyses indicated that TRSS-general predicted changes in PSWQ and LSAS scores prospectively. No significant associations were found between TRSS-general and changes in Padua

**Table 5**  
Regression analyses of Time 1 general threat-related reassurance seeking predicting anxiety symptoms at Time 2.

	$\Delta R^2$	F	$\beta$	p
Dependent variable: Time 2 Liebowitz Social Anxiety Scale				
Step 1	0.66	96.23		<0.001
LSAS-T1			0.72	<0.001
STAI-T-T1			0.02	ns
BDI-II-T1			0.17	<0.02
Step 2	0.03	12.63		<0.001
LSAS-T1			0.66	<0.001
STAI-T-T1			-0.06	ns
BDI-II-T1			0.14	<0.05
TRSS-G			0.21	<0.001
Dependent variable: Time 2 Padua Inventory				
Step 1	0.60	84.79		<0.001
PI-T1			0.80	<0.001
STAI-T-T1			0.01	ns
BDI-II-T1			-0.05	ns
Step 2	0.002	0.57		ns
PI-T1			0.81	<0.001
STAI-T-T1			0.02	ns
BDI-II-T1			-0.05	ns
TRSS-G			-0.05	ns
Dependent variable: Time 2 Penn State Worry Questionnaire				
Step 1	0.71	134.90		<0.001
PSWQ-T1			0.79	<0.001
STAI-T-T1			0.18	<0.005
BDI-II-T1			-0.14	<0.02
Step 2	0.02	13.54		<0.001
PSWQ-T1			0.72	<0.001
STAI-T-T1			0.14	<0.03
BDI-II-T1			-0.17	<0.003
TRSS-G			0.20	<0.001

Note: BDI-II-T1 = Beck Depression Inventory-II Time 1 score; STAI-T-T1 = State Trait Anxiety Inventory-Trait Time 1 score; LSAS-T1 = Liebowitz Social Anxiety Scale Time 1 score; PI-T1 = Padua Inventory Time 1 score; PSWQ-T1 = Penn State Worry Questionnaire Time 1 score; TRSS-G = general threat-related reassurance seeking Time 1 score.

Inventory scores, however. Analyses of Padua Inventory subscales also revealed no significant prospective associations.

We conducted additional analyses to examine whether a rival vulnerability factor, intolerance of uncertainty, also prospectively predicted changes in anxiety symptoms. We performed similar regression analyses as above with the exception that Intolerance of Uncertainty Scale total scores at Time 1 were substituted for Time 1 TRSS-general scores. Intolerance of uncertainty scores did not prospectively predict changes in any of the three anxiety disorder symptom dimensions.

We also sought to further examine the directionality of the relationship between ERS and anxiety pathology by testing whether any anxiety symptom measure predicted TRSS-general scores at Time 2. We conducted three separate regression analyses with Time 1 TRSS-general scores entered into Step 1 and Time 2 TRSS-general scores used as the dependent variable. The symptom measures were entered into Step 2 in each analysis. These findings revealed no relations between Time 1 PSWQ, LSAS, and Padua Inventory scores and subsequent reassurance seeking related to general threats,  $p$ 's > 0.50.

## 5. General discussion

Overall, the findings of the current studies suggest that ERS plays an important role in anxiety disorders. The measure we developed to assess two dimensions of threat-related ERS possesses sound psychometric properties, including excellent test-retest reliability and convergent validity with a measure of depressive reassurance

seeking. Further, after controlling for trait anxiety and depression, greater scores on this measure were associated with greater symptoms of OCD, social anxiety, and GAD. This suggests that these associations are not due to negative affect or co-occurring depressive symptoms, which have been implicated in certain forms of ERS (Joiner & Metalsky, 2001). An additional analysis revealed that each of these three symptom domains was uniquely related to ERS involving general threats. These findings are especially noteworthy because they suggest that ERS is an important transdiagnostic process occurring across anxiety disorders.

We also examined whether the associations between ERS and anxiety pathology could be due to shared variance with intolerance of uncertainty. Intolerance of uncertainty has been linked to several forms of anxiety pathology, and we found a standard measure of this construct was strongly correlated with both ERS and the measures of OCD, GAD, and social anxiety. However, even when controlling for intolerance of uncertainty, depression, and trait anxiety, the associations between these anxiety symptom measures and ERS remained. Interestingly, when both were entered simultaneously in a regression model, ERS was comparable in strength to intolerance of uncertainty in its prediction of anxiety symptoms.

The consistent and robust associations between ERS and anxiety pathology beg the question of direction of effects. We addressed this question in our prospective analyses. ERS involving general threats predicted changes in GAD and social anxiety symptoms but not OCD symptoms. No anxiety symptom measure predicted changes in ERS, however. This pattern of findings is consistent with a causal role for ERS in GAD and social anxiety symptoms. This stands in contrast to results obtained for intolerance of uncertainty. Despite the fact that intolerance of uncertainty is given a key role in cognitive models of GAD (Dugas et al., 2001), it did not predict changes in anxiety symptoms, including pathological worry.

Our analyses of symptom subscales revealed more specific relations between ERS and OCD and social anxiety symptoms. Among the OC symptom subscales, only thoughts of harm were uniquely associated with general ERS. These findings are consistent with those of Morillo et al. (2007), who found that ERS was a commonly used strategy for coping with unwanted intrusions among those with OCD. It is also consistent with one very recent factor-analytic study of OC symptom dimensions that indicated that reassurance-seeking compulsions loaded on the same factor as sexual, aggressive, and religious obsessions and mental compulsions (Williams et al., 2011). In addition, when both fear and avoidance social anxiety subscales were entered in a regression predicting ERS, only avoidance symptoms were uniquely predictive. These findings suggest that ERS may reflect or contribute to a lack of self-confidence that poses difficulties for fear confrontation and gives rise to avoidant behavior.

Our analyses of the TRSS subscales indicated that ERS related to negative evaluation was associated with GAD, OCD, and social anxiety symptoms, even after controlling for depression and anxiety. However, when both general and evaluative threat subscales were entered simultaneously in a regression model, only general threat-related reassurance seeking scores predicted these symptom domains, including social anxiety symptoms. This ran counter to our prediction that ERS related to evaluative threats would be more strongly related to social anxiety. Similar analyses found that general threat-related ERS but not depressive ERS was uniquely associated with anxiety symptoms. These findings suggest that evaluative and depressive ERS are pathological in nature but the relations between these types of ERS and anxiety pathology can be better accounted for by broader threat-related ERS tendencies. Practically speaking, these findings also suggest that researchers may benefit from simply using the 4-item general threat subscale in studies of ERS in anxiety disorders.

It is noteworthy that all three types of ERS were strongly correlated with each other and each was related to anxiety disorder and depressive symptoms. This implicates a general tendency towards ERS that is relevant across anxiety and depressive disorders. It also suggests that multiple forms of ERS are dysfunctional, regardless of the motivations underlying such behavior.

Important gender differences in ERS and its associations with anxiety pathology also emerged. Women reported markedly greater reassurance seeking than men. In addition, moderator analyses indicated that among women, greater reassurance seeking was associated with greater GAD symptoms, though this association was absent among men. Gender role norms may account for the lower reported ERS and the absence of significant associations between ERS and GAD symptoms among men. Men may be more likely than women to perceive ERS as a sign of weakness (i.e., as ‘unmanly’) and may underreport for this reason; however, there is little research to support this explanation. Further examination of ERS, preferably in a natural context and between and within genders, may help clarify these findings.

### 5.1. Limitations and future directions

Some limitations of the current investigation, as well as directions for future research, deserve mention. First, the use of a non-clinical, predominantly female student sample may affect the generalizability of findings to anxious populations and points to the need for data on ERS in clinical samples with a greater number of male participants. However, this sample was not without anxiety. For example, 19.5% of the sample scored in the clinical range for GAD symptoms, and 19% scored in the clinical range for social anxiety disorder symptoms. Second, our analyses relied on self-report data. Research using behavioral indices of ERS would be helpful in increasing the understanding of this phenomenon, especially in light of the fact that ERS may be underreported among men. Third, our measure of reassurance seeking was relatively brief. Though the two subscales were identical in length to that of a published depressive reassurance seeking scale (Metalsky et al., 1991), there may be advantages to using longer measures. Two items from the initial pool that were subsequently discarded reflect negative interpersonal consequences of reassurance seeking that may only be present at levels of ERS that are particularly excessive. Additionally, even though we ruled out some third-variable explanations of the observed associations, the correlational nature of the data means that unmeasured third-variable explanations cannot be ruled out. Experimental research is needed to determine the causal nature of ERS in anxiety disorders (e.g., instructing participants to increase or decrease ERS). Further, the time frame for our prospective analyses (one month between assessments) may not have been sufficient to capture natural variability in symptoms or ERS. Interrelationships between ERS and anxiety symptoms may be worth exploring using longer time frames or daily assessments. Lastly, though we were able to rule out several potential mediators, including depression, trait anxiety, and intolerance of uncertainty, we were not able to identify the exact mechanisms by which ERS may contribute to anxiety pathology. Consideration of potential mediators, including threat perception and self-efficacy related to threat management, would help clarify the relationship between ERS and anxiety disorder symptoms.

## 6. Conclusion

The findings of the present study have important clinical implications. They suggest that ERS plays a role in multiple anxiety disorders, and clinicians would benefit from the assessment and treatment of this behavior in anxious individuals. The consistent

associations between ERS and symptoms of multiple anxiety disorders and depression also support the consideration of ERS in transdiagnostic treatment protocols.

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