The looming maladaptive style predicts shared variance in anxiety disorder symptoms: further support for a cognitive model of vulnerability to anxiety

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Abstract

Looming vulnerability pertains to a distinct cognitive phenomenology characterized by mental representations of dynamically intensifying danger and rapidly rising risk as one projects the self into an anticipated future [J. Pers. Soc. Psychol. 79 (2000) 837]. While looming appraisals can be experienced as state elicitation, some individuals are hypothesized to develop an enduring cognitive pattern of cross-situational looming appraisals, the looming maladaptive style (LMS), which functions as a cognitive vulnerability to anxiety. In the present study, we examined the extent to which the LMS predicts common variance in numerous anxiety disorder symptoms, independent of the potentially confounding effects of current depressive symptoms. Specifically, we hypothesized that controlling for depressive symptoms, LMS would predict shared variance in a latent factor comprised of indicators of five anxiety disorder symptoms: obsessive–compulsive disorder, post-traumatic stress disorder, generalized anxiety disorder, social phobia, and specific phobic fears. Measures of these anxiety disorder symptoms, depressive symptoms, and looming vulnerability were administered to unselected college student population. Structural equations modeling analyses provided...
support for our hypothesis that LMS predicts shared variance in anxiety disorder symptoms and suggest that this cognitive style may be an overarching dimension of vulnerability to anxiety.

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The “looming vulnerability” model of anxiety posits that the distinct cognitive phenomenology of anxiety and anxiety disorders involves mental representations of dynamically intensifying danger and rapidly rising risk (Riskind, 1997; Riskind, Williams, Gessner, Chrosniak, & Cortina, 2000). According to Riskind and colleagues (2000) a unique feature of the mental scenarios generated by anxious individuals is the perception of threat movement as still unfolding and intensifying as one projects the self into an anticipated future. The looming vulnerability model is consistent with Beck’s theoretical formulation of anxiety (e.g., Beck & Emery, 1985) in asserting that exaggerated appraisals of threat-related information result in fear and anxiety. However, the looming vulnerability model extends Beck’s formulation with the idea that fear and anxiety occur most intensely when such exaggerated appraisals of threat involve dynamic mental scenarios of rapidly rising risk and intensifying danger.

All individuals are assumed to have the capacity to mentally represent or forecast how potentially threatening situations are likely to develop or play-out, as a product of our autonoetic consciousness (i.e., the uniquely human ability to represent past, present, and future; Wheeler, Stuss, & Tulving, 1997). Cognitively vulnerable individuals, however, are assumed to develop mental representations in which anticipated threats are escalating in risk, moving toward the self or toward a dreaded final outcome, and moving through time (i.e., looming). Once activated, the sense of looming vulnerability is a critical phenomenological component of threat that sensitzes anxious individuals to threat movement and signs of intensifying danger in their environments, biases their cognitive processing, and renders their anxiety to be more persistent and less likely to habituate (Riskind, 1997; Riskind & Williams, in press-a).

Several studies based on the looming vulnerability model have examined the covariation between specific forms of looming vulnerability and relevant anxiety and fear outcomes (e.g., Riskind, Abreu, Strauss, & Holt, 1997; Riskind, Kelly, Harman, Moore, & Gaines, 1992; Riskind & Maddux, 1993, 1994; Riskind, Moore, & Bowley, 1995; Riskind & Wahl, 1992; Riskind, Wheeler, & Picerno, 1997). Studies have demonstrated moderate correlations between looming appraisals of potential threat(s) and stimulus-specific fears of spiders (e.g., Riskind et al., 1992, 1995), fears of individuals with Auto-Immune Deficiency Syndrome or HIV virus (Riskind & Maddux, 1994), contamination fears (Riskind, Abreu, et al., 1997; Riskind, Wheeler, et al., 1997), and social rejection (e.g., Riskind & Maddux, 1993). For instance, individuals with obsessionaal fears of contamination
report looming appraisals of contaminants as rapidly approaching, spreading, or rising in risk (Riskind, Abreu, et al., 1997; Williams, Riskind, & Olatunji, 2003).

1. The looming maladaptive style

Although looming appraisals of threat can be experienced simply as a state elicitation, they can also develop into a more durable cognitive pattern. Riskind and colleagues (2000) proposed the looming maladaptive style (LMS) as a broad and pervasive cognitive pattern to cross-situationally appraise threat as rapidly rising in risk, progressively worsening, or actively accelerating and speeding up. The LMS is conceptualized as a schema-driven, evolutionarily based process of threat/harm appraisal that is assumed to systematically bias the ways in which individuals mentally represent the temporal and spatial progression of possible future threat. Moreover, the LMS is posited to represent a unique cognitive risk factor for anxiety but not depression that functions as a danger schema (Riskind et al., 2000).

1.1. Convergent validity of the LMS

A number of studies provide support for the construct validity of the LMS as a cognitive vulnerability to anxiety (e.g., Riskind & Williams, in press-a; Riskind et al., 2000; Williams & Riskind, 2003a). These studies indicate that cognitively vulnerable individuals, those high in the LMS, demonstrate higher levels of anxious symptoms, as measured on the Beck Anxiety Inventory and the Spielberger Trait and State Anxiety Scales ($r$'s range from .30 to .52), as well as higher levels of several correlates of anxiety, including worry, thought suppression, catastrophizing, and behavioral avoidance (e.g., Riskind & Williams, in press-a; Riskind et al., 2000; Williams, 2002; Williams & Riskind, 2003b). Recent experimental studies have also demonstrated the individuals high in the LMS demonstrate attentional vigilance for threatening visual images, enhanced estimations of environmental threat, and a memory bias for threatening information, even when the effects of current levels of anxious symptoms are controlled (Riskind & Williams, in press-a; Williams et al., 2003).

Several studies also provide prospective evidence for the LMS as a distal vulnerability (i.e., cognitive diathesis) that interacts with stress (e.g., negative life events) to confer increased risk for anxiety symptoms and anxiety disorders. For example, a recent study provides evidence that LMS interacts with negative life events to predict residual change in anxious symptoms over a 2-month time period (Williams, 2002; Williams & Riskind, 2003a). Further, several short-term prospective studies demonstrate that LMS predicts residualized gains in worry over intervals from 1 week (Riskind et al., 2000, Study 2) to 6 weeks (Riskind & Williams, in press-b), as well as residualized gains in catastrophizing over a 1-week time interval (Riskind & Williams, 1999). These prospective studies,
however, are in their relative infancy as the need to demonstrate cross-sectional relationships remains prudent prior to engaging in labor-intensive longitudinal studies.

A growing body of studies provides evidence for applicability of LMS to a variety of different anxiety disorders. Riskind and Williams (in press-b) showed that scores for the putative cognitive vulnerability were significantly elevated in a community sample of patients with GAD, as compared to a sample of patients with depressive disorders or to normal controls. Riskind, Gessner, and Wolzon (2003) found in a study of inpatients in a detoxification unit for alcohol and substance abuse that those who were diagnosed with GAD had significantly higher scores on the cognitive vulnerability than similar patients who did not have GAD. Riskind, Chambless, and Holt (2003) conducted a study with patients with panic disorder and found that the tendency to generate mental scenarios of rapidly intensifying somatic symptoms predicted significant variance in both somatic symptoms and agoraphobic cognitions beyond the effects of other relevant variables.

1.2. Divergent validity of the LMS

LMS is not simply another measure or proxy for trait anxiety or anxious symptoms. Riskind and colleagues (2000, Study 2) demonstrated in a confirmatory factor analysis that while the LMS and anxious symptoms, trait anxiety, and worry are correlated, their measurement properties clearly distinguish between them. Similarly, studies have indicated that LMS, though correlated with measures of neuroticism, negative affect, or negative life events, can clearly be distinguished from these variables, and that it predicts distinct variance in anxiety over and above that predicted by these measures (Riskind et al., 2000). Several experimental studies also demonstrate that LMS continues to exert effects on information processing (attention, memory, cognitive accessibility, etc.), even when the effects of anxious symptoms, worry, trait anxiety, or catastrophizing are controlled (e.g., Riskind & Williams, 1999; Williams et al., 2003).

LMS differs as conceptually distinct, though not mutually exclusive, from anxiety-related variables, such as worry, catastrophizing, and interpretative biases. For example, according to the looming vulnerability model, LMS is predicted to operate prior to worry, such that cognitively vulnerable individuals first generate mental representations of rapidly rising risk and then employ self-protective processes, such as worry to distance themselves from the aversive imagery, implicit in their mental representations (Williams & Riskind, 2003b). Likewise, LMS differs from catastrophizing in that it emphasizes the perceived velocity and rate of change involved in catastrophic cognitions, rather than simply the imagined outcomes (e.g., whereas catastrophizing may involve associating missing a mortgage payment with ultimately being homeless, LMS involves examining the expected rate of change and velocity with which missing a mortgage payment would lead to homelessness). Empirical evidence suggests
that LMS accounts for significant unique variance in anxiety symptoms beyond the effects of catastrophizing (e.g., Riskind & Williams, 1999).

Finally, LMS is thought to differ from interpretative biases (i.e., the tendency to interpret ambiguous information as threatening), in that the former emphasizes both the outcome and process of arriving at a conclusion, while the later focuses on the outcome. Consistent with Mathews and MacLeod’s (1985) proposition that interpretative biases associated with anxiety are due to danger schemas, we posit that LMS constitutes one such underlying danger schema that leads to an interpretation bias in the direction of threat. For example, a panic disordered patient may demonstrate an interpretive bias to attribute increased autonomic arousal (e.g., increased heart rate) to having a heart attack (e.g., Clark et al., 1997). According to the looming vulnerability model, such an individual is likely to derive such an interpretative bias from generating a schematically based dynamic mental representation that includes not only the dreaded outcome but also a perceived velocity and rate of change (e.g., how quickly the heart attack is taking place or how soon after noticing an increased heart rate the heart attack is likely to occur). Several studies provide evidence that the LMS results in an interpretative bias in the direction of threat for homophones (Riskind et al., 2000) and ambiguous visual stimuli (Williams & Riskind, 2003b; Williams et al., 2003), even in currently non-anxious individuals. Thus, LMS can lead individuals to engage in worry, catastrophizing, and interpretive biases, but LMS also involves forecasting the perceived rate of change and velocity with which anticipated future threats are likely to occur.

Remarkably, consistent evidence has also been found for the discriminant validity of LMS, most notably in differentiating between anxiety and depression. For example, in several past studies the significant relationship between the LMS and anxiety remains highly significant when the variance due to depression is statistically controlled, whereas the correlation between LMS and depression is reduced to nonsignificance when the variance due to anxiety is controlled (Riskind et al., 2000; Williams, 2002). Moreover, in a recent prospective study LMS interacted with negative life events to predict changes in anxious, but not depressive symptoms (Williams & Riskind, 2003a). Findings that demonstrate specificity of LMS are promising because past investigators have found it difficult to find self-report measures of presumed cognitive characteristics of anxiety that are not also strongly correlated with depression (e.g., Barlow, 2000).

The relatively high correlation between anxiety and depression has prompted some to propose that these symptoms and disorders are best conceptualized in terms of a common higher order factor — negative affect — as outlined in the tripartite model of anxiety and depression (e.g., Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991; Tellegen, 1985). This model suggests that anxiety and depression are closely related, share common diatheses, and share common vulnerabilities and proximal risk factors. For example, Barlow (2000) posits that a sense of relative uncontrollability is a shared vulnerability to both anxiety and depression, whereas others have hypothesized that anxiety may be a temporal
precursor to depression (cf., Alloy, Kelly, Mineka, & Clements, 1990). In contrast, the LMS is proposed as a specific cognitive vulnerability for anxiety and anxiety disorders, but not depression.

2. Present study

While previous studies have provided mounting evidence for the construct validity of LMS, one tenet of the looming vulnerability model has not yet been directly tested: That LMS represents an overarching cognitive vulnerability that is common to anxiety and anxiety disorder symptoms, but not depression. In the present study the extent to which LMS predicted common variance in numerous anxiety disorder symptoms (e.g., obsessive–compulsive symptoms, post-traumatic stress disorder symptoms, generalized anxiety disorder symptoms, phobic symptoms, etc.) was examined using structural equation modeling (SEM, Hoyle & Smith, 1994). Unfortunately, a measure of panic disorder symptoms was not included in the current study, but other studies support the association between LMS and panic symptoms (e.g., Riskind, Chambless, et al., 2003). In addition, independent contributions of LMS to anxiety disorder symptoms were examined.

Fig. 1. Conceptual model of the study. Ellipses represent latent variables and rectangles represent manifest, or measured, variables. Circled “e” represents a unique variance of the manifest variables, which are not accounted for by the latent factors. Circled “d1” represents the residual variance (“disturbance”) of the latent factor “Anxiety” that is not accounted for by the latent factors “Looming” and “Depression”.

$e_1$ $e_2$

SOCLOOM PHYLOOM

LMS

Anxiety

Depression

BDIPHYS BDICOG

FNE OCD GAD PTSD SPF

e_3 e_4 e_5 e_6 e_7 e_8 e_9
d_1
by simultaneously entering depressive symptoms in the model to control for their potentially confounding effects.

A central characteristic of SEM is its ability to partition various sources of variance in target variables, and to assess the extent to which these various sources of variance covary with other variables. Fig. 1 presents the hypothesized structural model. As can be seen in this figure we predicted: (1) An effect of the depressive symptoms latent factor on the anxiety latent factor; and, (2) An effect of the LMS latent factor on the anxiety latent factor.

An unselected college student population completed self-report measures of anxiety disorder symptoms (OCD, GAD, PTSD, FNE, and SPF), depressive symptoms, and the LMS. An unselected student population was selected in this study in an attempt to examine individuals who do not currently have anxiety disorders but who are hypothesized to be at high or low levels of psychological risk for anxiety disorders and anxiety disorder symptoms. Individuals were excluded from participation in this study if they endorsed a current diagnosis of anxiety or mood disorders. Controlling for depressive symptoms, we expected the LMS to have a statistically significant effect on the latent anxiety factor, created from the manifest indicators of the OCD, GAD, PTSD, FNE, and SPF, and that the specific effects of the LMS on these indicators would be nonsignificant.

3. Method

3.1. Participants and procedure

One hundred and twenty-three students (92 females and 31 males) at a diverse urban university who ranged in age from 18 to 33 (M = 19.80, S.D. = 2.68) participated in this study in exchange for course credit. The majority of participants described themselves as Caucasian (62%), but a variety of other racial groups participated such that the sample provided an adequate representation of the student population.

Participants were assembled in small groups of 10–12 persons and asked to complete a battery of questionnaires that contained the measure of looming vulnerability, depressive symptoms, symptoms of OCD, GAD, and PTSD, fear of negative social evaluation (FNE), and specific phobic fears (SPF). The present study did not include a measure of panic disorder symptoms.

3.2. Measures

3.2.1. Looming maladaptive style

Looming Maladaptive Style Questionnaire (LMSQ; Riskind et al., 2000) is a validated measure of individuals' tendency to generate mental scenarios of potentially threatening situations that are rapidly rising in risk or intensifying in danger. Participants read six brief vignettes describing potentially stressful
situations and then completed three questions for each vignette using a 5-point Likert scale (i.e., “In this scene are the chances of your having difficulty decreasing or expanding with each moment? Is the level of threat in the encounter staying fairly constant or is it growing rapidly larger with each passing moment? How much do you visualize your problem as in the act of becoming progressively worse?”). Riskind and colleagues (2000) provided evidence for the predictive, convergent, and discriminant validity of the measure, as well as its internal consistency, and test–retest stability. A recent study (Williams, 2002) extends this evidence and provides support for the test–retest reliability of LMS scores over a 6-week time interval ($r = .84$).

A total LMS Score is calculated by aggregating responses to these three items across the six vignettes. Alternatively, two indices of social looming (i.e., looming appraisals in response to potentially threatening social stimuli: SOCLOOM) and physical looming (i.e., looming appraisals in response to potentially threatening physical stimuli, such as an auto accident or experiencing “odd heart palpitations”: PHYSLOOM) can be derived by aggregating responses to three social looming and three physical looming vignettes (e.g., Riskind et al., 2000). Results of a recent study provide evidence for the divergent validity of PHYSLOOM and anxiety sensitivity (Reiss & McNally, 1985), as well as between the general LMS construct and anxiety sensitivity (Williams, 2003).¹

### 3.2.2. Depressive symptoms

Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996) is a 21-item self-report inventory of depressive symptoms. Participants were asked to complete the measure with respect to the last 2 weeks. Each item is rated on a 0–3 scale, and scores are summed across items. Thus, scores can range from 0 to 63. Although the BDI is not indicative of the full clinical syndrome of depression, it is a reliable and well-validated measure of depressive symptoms (see Beck, Steer, & Garbin, 1988 for a review).

¹ To assuage concerns of the potential overlap between the constructs of anxiety sensitivity (AS) and the LMS, a second study was conducted. One hundred and eighty-one individuals completed measures of anxiety sensitivity, LMS, anxiety and depressive symptoms, and worry. Results of this study revealed a moderate correlation between AS and the LMS ($r = .40$, $P < .001$). As predicted, the LMS and AS revealed unique patterns of prediction with the anxiety and depressive symptom variables. Specifically, when the effects of AS were controlled, the LMS remained significantly correlated with general measures of anxiety (e.g., Trait anxiety, $r = .26$, $P < .001$; BAI, $r = .34$, $P < .001$), and measures of worry (e.g., meta-worry, $r = .22$, $P < .01$; social worry, $r = .31$, $P < .001$), but was not correlated with measures of depressive symptoms (e.g., BDI, $r = -.01$, ns). When the effects of the LMS were controlled, AS remained significantly correlated with measures of anxiety (e.g., Trait anxiety, $r = .42$, $P < .001$; BAI, $r = .45$, $P < .001$), measures of worry (meta-worry, $r = .35$, $P < .001$; health worry, $r = .50$), and remained moderately correlated with depressive symptoms (BDI, $r = .36$, $P < .001$). These results suggest that both anxiety sensitivity and the LMS contribute uniquely to the prediction of general anxiety symptoms and anxiety-related constructs, like worry. Moreover, these results suggest that the LMS is a specific vulnerability to anxiety, whereas anxiety sensitivity appears to be a more general vulnerability to both anxiety and depression.
Previous work with the BDI has identified separate factors reflecting cognitive and physiological symptoms (see Beck et al., 1988). Following this earlier work, a *cognitive symptoms* measure (COG) was comprised of 12 items (e.g., I feel as though I am worthless; scores range from 0 to 36); and a *physiological symptoms* measure (PHYS) was comprised of 9 items (e.g., I feel too tired to do anything; scores range from 0 to 27). As would be expected, these two subscales were highly correlated (see Table 1 below). Nonetheless, in line with past work (Billings, Cronkite, & Moos, 1983; Joiner & Rudd, 1996), we used the two subscales as manifest indicators of a latent depressive symptoms variable. In the present study, we obtained adequate internal consistency for both scales (\(\alpha = .87\) COG and \(\alpha = .78\) PHYS).

### 3.2.3. Anxious symptoms

*Fear of Negative Social Evaluation* (FNE: Leary, 1983; Watson & Friend, 1969) is a self-report measure of expectation and distress related to negative evaluation from others. While fears of negative social evaluation are a central feature of social phobia, the FNE appears to be a more accurate measure of social anxiety than social phobia. Several studies have provided evidence that the FNE lacks specificity in differentiating GAD and panic disorder from social phobia, but reliably differentiates between social phobia and simple phobias (e.g., Oei, Kenna, & Evans, 1991; Turner, McCanna, & Beidel, 1987). Though the FNE may lack specificity, it has been shown to be one of the most sensitive social phobia treatment outcome measures (e.g., Cox et al., 1998). In this study, Leary’s (1983) 12-item brief version of the FNE was employed. This version is highly correlated with the original scale and the response format was changed from

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*Notes. N = 123; LMSQ-SOC: Social scenarios subscale of the LMSQ; LMSQ-PHYS: Physical scenarios of the LMSQ; BDI-COG: Cognitive symptoms factor of the BDI; BDI-PHYS: Physical symptoms factor of the BDI; OCD: Padua Inventory of Obsessions and Compulsions; GAD-Q: Generalized Anxiety Disorder Questionnaire; PTSD: Purdue PTSD Scale-Revised; FNE: Fear of Negative Social Evaluation Scale; FSS-II: Fear Survey Schedule-II. All the correlations are statistically significant (\(P < .001\)).*
true/false to a 5-point scale. The brief FNE has demonstrated very good internal consistency, test–retest reliability, and validity (Leary, 1983).

Fear Survey Schedule-II (FSS-II: Geer, 1965) is a 51-item self-report measure that assesses an individual’s fear or distress to a number of potential fear evoking situations and stimuli. Participants rate their fear of each object or situation on a 7-point scale ranging from 0 (none) to 6 (terror). Aggregating responses to the 51-items generates a total Specific Phobic Fears (SPF) Index Score.

Generalized Anxiety Disorder Questionnaire (GAD-Q: Rohmer, Borkovec, Posa, & Borkovec, 1995) is a self-report measure that was designed to assess DSM-III-R and anticipated DSM-IV criteria for GAD. Questions inquire about the occurrence of unrealistic, excessive, and uncontrollable worry; the contents of worrisome topics; the occurrence of being bothered by worries more days than not in the past 6 months; the extent to which worry interferes with daily life functioning; and 18 associated symptoms of motor tension, autonomic hyperactivity, vigilance, and scanning that have been experienced in the past 6 months.

Padua Inventory (PI: Sanavio, 1988) is a self-report measure of obsessions and compulsions that yields four factors: Impaired control over mental activities, Becoming contaminated, Checking behaviors, and Urges and worries of losing control over motor behaviors. In the present study a short form of the PI was used, based on Sanavio’s (1988) original factor analysis of this measure. Averaging scores of this instrument yielded a manifest index of OCD symptoms.

Purdue PTSD Scale-Revised (PPTS-R: Lauterbach & Vrana, 1996) is a self-report measure of the symptoms found within PTSD Criteria B, C, and D of the DSM-IV (e.g., experiencing of the trauma, persistent avoidance of reminders of the trauma and numbing of responsiveness to such reminders, and persistent hyperarousal). In this study, participants were first presented with an operational definition of what constitutes a traumatic event that was based on DSM-IV PTSD criteria, as follows: The following questionnaire asks about your experience and reaction to traumatic events that have occurred in the last month. A traumatic event includes both direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one’s safety or wellbeing; or witnessing an event that involves death, injury, or a threat to the safety or wellbeing of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or close associate. Traumatic events may include, but are not limited to sexual assault, physical attack, robbery, mugging, military combat, being kidnapped, severe accidents, or being diagnosed with a life-threatening illness.

After reading the above description respondents rated frequency of occurrence within the previous month for each of 17 items on a 5-point scale ranging from 1 (not at all) to 5 (often). The PPTS-R has demonstrated good convergent validity with other measures of PTSD symptomatology ($r$’s range from .50 to .66) and moderately correlations with measures of anxious and depressive symptoms ($r$’s = .37 and .39, respectively) (Lauterbach & Vrana, 1996). Further, Lauterbach and Vrana (1996) provide evidence that students who experienced at least one
traumatic event scored significantly higher on the PPTS-R than those who did not report any traumatic events. In the present study, 48% of participants did not report a traumatic event.

4. Results

4.1. Data analysis

Our hypotheses were tested using SEM (Hoyle & Smith, 1994), with the AMOS 4.01 program and the Maximum Likelihood (ML) estimation procedure. Model fit was examined via several common indices: $\chi^2$ index, Non-Normed Fit Index (NNFI; Bentler & Bonett, 1980), Comparative Fit Index (CFI; Bentler, 1990) and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1980). Model comparison was conducted via the Chi-Square Difference Test (CSDT).

The model tested herein involves three latent variables: LMS, Depression, and Anxiety Disorder Symptoms. The LMS latent variable was assessed via the SOCLOOM and PHYSLOOM indicators. The Depression latent variable was measured via the COG and PHYS indicators. Finally, the Anxiety Disorder Symptoms latent variable was assessed via the OCD, PTSD, GAD, FNE, and SPF indicators. Consistent with recommendations of Byrne (1989) and with past work (Joiner, 1996) one construct loading (SOCLOOM, COG, and OCD) for each latent variable was set to 1.00 to provide a metric for the latent constructs and to identify the measurement model. In this model, the Anxiety Disorder Symptoms latent variable served as the outcome, and was predicted by the LMS and Depression latent variables. These two predictors were allowed to correlate. Thus, we were able to examine the effect of the LMS on Anxiety Disorder Symptoms while controlling for the confounding effect of Depression.

4.2. Results of the CFA

In accord with recommendations of Anderson and Gerbing (1988) we employed a two-step approach in testing our final structural model. In the first step a confirmatory factor analysis (CFA) was conducted on the correlation matrix presented in Table 1 to establish the measurement model. Results of the CFA revealed that loadings of all the manifest indicators on their respective latent variables were strong (i.e., ranging from $\beta = .53$ to $\beta = .93$) and highly statistically significant ($P < .001$). In addition, the correlations between the three latent variables were all statistically significant ($P < .001$). The correlation between LMS and Depression was $r = .47$, the correlation between LMS and Anxiety Disorder Symptoms was $r = .69$, and the correlation between Depression and Anxiety Disorder Symptoms was $r = .83$.

Examination of the model’s fit revealed that, with the exception of the CFI (.96), the other fit was somewhat less than adequate ($\chi^2[24] = 53.09, P = .001$;
NNFI = .89; RMSEA = .10). Model modification indices suggested that fit of the model might be substantially improved by adding a correlation between the unique variances of SOCLOOM and FNE. Indeed, a careful examination of the content of the items comprising the SOCLOOM subscale indicated that these items include predominant themes of fear of negative social evaluation (e.g., the SOCLOOM situations include a negative encounter with a relationship partner, social rejection in a group setting, and speaking in front of a large group), thereby accounting for this residual correlation. When this correlation was added to the model, the CSDT indicate a statistically significant improvement in model fit (CSDT = 12.15, df = 1, P < .001). Although the $\chi^2$ was still statistically significant ($\chi^2[23] = 40.93, P = .01$), other fit indices suggested that the fit of the model was adequate (NNFI = .93; CFI = .96; RMSEA = .08). We therefore decided to refrain from further modifications and accept this model as the final measurement model. This final measurement model is presented in Fig. 2.

4.3. Results of the SEM's

The fit of the structural model was, by definition, identical to the fit of the measurement model (i.e., $\chi^2[23] = 40.93, P = .001$; NNFI = .93, CFI = .96, RMSEA = .08). As expected, both LMS and Depression predicted elevated levels of the Anxiety Disorder Symptoms latent outcome ($\beta = .34, P < .01; \beta = .66, P < .001$, respectively). These results demonstrate that even after controlling for the strong confounding effect of depressive symptoms, the LMS still predicted shared variance in the anxiety disorder symptom measures.
We then estimated the unique effects on LMS on OCD, GAD, PTSD, FNE, and SPF while controlling for the equivalent effects of depressive symptoms. Consistent with our hypotheses, we found that none of these unique effects were significant. We did, however, find an unexpected unique effect of depressive symptoms on PTSD ($\beta = .49, P < .001$). Because addition of this effect improved model fit (CSDT = 11.70, $df = 1$, $P < .01$), we considered the model with the added effect as the final structural model. This model, which evinced a very good fit ($\chi^2[22] = 29.23, P = .14$; NNFI = .97; CFI = .98; RMSEA = .05), is presented in Fig. 3.

5. Discussion

In the present study, our main purpose was to examine the supposition that the cognitive phenomenology of looming vulnerability underlies the common features of numerous anxiety disorder symptoms. Specifically, we hypothesized that the LMS would predict a latent factor comprised of indicators of five anxiety disorder symptoms: obsessive–compulsive disorder (OCD), generalized anxiety disorder (GAD), post-traumatic stress disorder (PTSD), fear of negative evaluation (FNE), and specific phobic fears (SPF). Results were consistent with our hypothesis and lend support to the assumption that looming vulnerability is a common overarching theme in the cognitive phenomenology of anxiety.

These findings have special importance given the collective lack of compelling evidence in the literature for questionnaire measures of anxiety or threat-related...
cognition that show some specificity to anxiety versus depression, especially in nonclinical populations (Riskind, 1997; Riskind et al., 1992). A recent meta-analysis (Beck & Perkins, 2001) conducted on results from both clinical and nonclinical studies found that both anxiety-related automatic thoughts and worry lack adequate cognitive-content specificity to differentiate between anxiety and depression. Our results, however, suggest that the construct of looming vulnerability is specific to the cognitive phenomenology of anxiety and anxiety disorder symptoms, and predicts unique variance in such measures with the effects of depression controlled.

5.1. Cognitive vulnerability to anxiety

Most anxiety investigators recognize that anxiety disorders and other psychological problems result from interactions between personal characteristics and environmental precipitants. Many individuals who are exposed to precipitating stressful events, however, do not develop significant disorders. In the light of these findings, cognitive vulnerability-stress models are offered to help account for not only who is vulnerable to developing emotional disorder (e.g., individuals with a particular cognitive style), and when (e.g., after a stress), but to which disorders they are vulnerable (e.g., depression, eating disorder, etc.; Riskind & Alloy, in press). In this way, stressful events can trigger the development of emotional disorders or psychological problems for certain individuals (e.g., see Alloy, Abramson, Raniere, & Dyller, 1999), but the specific degree and even direction of the response can differ enormously from one person to another.

The cognitive factors that are conceived to be important in emotional disorders can include both distal phenomena, which were present before the disorder, and proximal phenomena that occur close in time to symptoms. Distal cognitive factors are normally relatively enduring cognitive predispositions (such as dysfunctional attitudes or maladaptive cognitive styles) to respond to stressful situations in maladaptive ways. In this way, cognitive vulnerability factors are higher in generality (or abstraction) as well as more distal to future episodes than proximal cognitions, which are more transitory or specific, and which occur very close to, or even during, the future episode of disorder. On this view, proximal cognitions (such as specific thoughts or images) are typically produced when individuals process the meaning of a stressful event in any situation through the filter of underlying cognitive styles and/or vulnerabilities. Thus, cognitive vulnerability factors represent potential antecedent causes (distal causes) that operate toward the beginning of the temporal sequence, distant in time from the occurrence of the disorder.

A limitation of much of the recent research on cognitive factors implicated in anxiety disorders is that it has focused on proximal phenomena (e.g., Heimburg, in press; Rachman, Shafrin, & Riskind, in press; Riskind & Williams, in press-a). The preponderance of research has examined proximal phenomena, such as negative threat-related thinking and/or interpretation biases occurring among
individuals who are currently anxious or symptomatic. Any compelling psychological approach to anxiety must take account of individual differences in antecedent cognitive vulnerability that affect the ways in which phenomena that are distant in time to the occurrence of anxiety disorders influence the probability that such disorders will occur. LMS is proposed to address this need by examining an antecedent cognitive vulnerability that can operate at the beginning of the temporal sequence, before the anxiety symptoms or disorder appear. Consistent with this view, LMS is hypothesized as one potential danger schema that may be causally implicated in more proximal anxiety-related cognitive process, such as interpretative biases, catastrophizing, and/or worry. Recent studies provide evidence that the LMS is predictive of future anxiety symptoms (e.g., Williams, 2002; Williams & Riskind, 2003a).

The only major exception in the anxiety literature that has been examined as a distal cognitive vulnerability is anxiety sensitivity. Anxiety Sensitivity (AS) refers to the perception that anxiety symptoms may produce adverse or harmful consequences (Reiss & McNally, 1985). While anxiety sensitivity was initially conceptualized as a broad vulnerability factor much of the empirical research and subsequent theory has emphasized anxiety sensitivity as specific vulnerability to panic disorder (McNally & Lorenz, 1987; Schmidt & Woolaway-Bickel, in press). By contrast, results of the present study are consistent with the supposition that LMS is an overarching dimension of vulnerability to anxiety disorder symptoms in general. Results of a current study should assuage concerns of redundancy between the constructs of anxiety sensitivity and LMS, in that these constructs were shown to be distinct and to have different patterns of prediction with regard to anxiety symptoms (Williams, 2003).

From a methodological point of view, the present study provides an additional illustration of the potential utility of SEM analysis in pursuing clinical research questions (see Hoyle & Smith, 1994). A feature of SEM that was most relevant to the present study was the fact that in using SEM, the investigator is able to identify underlying sources of variance in measured variables, to attribute these sources to one latent variable, and to establish relations between latent variables. This feature of SEM addresses the important issue of specificity (Garber & Hollon, 1991), namely, the issue of whether a certain vulnerability factor is specific to a certain clinical outcome. Thus, our construction of a latent anxiety disorder symptoms factor enabled us to partition the variance of OCD, PTSD, GAD, FNE, and SPF that is shared by other anxiety disorder symptoms from the variance unique to each anxiety disorder (i.e., the variance that is not shared by the latent factor). In turn, we were able to examine the effects of depressive symptoms and looming on both types of variance facets, enabling a more detailed description of the role of looming cognitive vulnerability in anxiety.

We found an unexpected significant unique effect of depressive symptoms on PTSD. This unique effect could be seen as reflecting the comorbidity of PTSD symptoms and depressive symptoms (e.g., Resick, 1993). Alternatively, this unique effect may represent the similarity of the cognitive content of PTSD
and depressive symptoms, in that both may entail cognitions about personal incompetence or the emptiness and danger of the world. For example, Foa, Ehlers, Clark, Tolin, and Orsillo (1999) posited that three beliefs are predictive of PTSD severity: negative cognitions about the self, negative cognitions about the world, and self-blame. There are striking similarities between Foa and colleagues three beliefs and Beck’s (1987) hypothesized negative cognitive triad in depression (e.g., negative beliefs about the self, the world, and the future).

Five limitations of the present study should be mentioned. First, we relied exclusively on self-report measures to assess the study variables, and it is possible that the shared method variance of these variables inflated the results obtained. It is important to note, however, that because looming research is currently at its early stages, the only available measure of looming vulnerability is the self-report LMSQ. Current efforts are being made to improve the LMSQ, as well as to construct non-self-report measures of this intriguing cognitive phenomenon. Moreover, because SEM specifically models and accounts for error variance, this issue is less likely to affect our study as compared to those that do not use SEM.

Another limitation pertains to our reliance on a cross-sectional design, which limits the ability to examine causal relations between variables (Kobasa, Maddi, & Puccetti, 1985). Although previous studies have supported the longitudinal effect of looming on anxiety (Riskind & Williams, in press-a; Riskind et al., 2000; Williams, 2002; Williams & Riskind, 2003a), it would be important in the future to replicate our findings using a longitudinal design. It should be noted, however, that cross-sectional findings provide an important justification for more labor intensive longitudinal studies. Other possibilities, such as reciprocal, cross-lagged relations between looming and anxiety, should also be examined in future studies.

The final three limitations in the present study pertain to the researchers’ choice of measures of anxiety disorder symptoms. Specifically, the FNE appears to be a better measure of social anxiety than social phobia, and lacks specificity in differentiating social phobia from GAD and panic disorder (e.g., Turner et al., 1987). In addition, the PPTS-R appears to be an adequate measure of PTSD symptomatology, but it would have been useful to assess the actual experience of traumatic events, rather than to provide participants with a narrative operational definition of what constitutes an appropriate traumatic event. Finally, it would be useful to include a specific measure of panic disorder symptomatology in future studies that examine the generality of the LMS to anxiety disorder symptoms. A current study is underway to examine the differential prediction of anxiety sensitivity and the LMS in predicting the full spectrum of anxiety disorder symptoms.

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