

Looming Vulnerability: Incremental Validity of a Fearful Cognitive Distortion in Contamination Fears

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Abstract Looming vulnerability is a cognitive vulnerability for anxiety syndromes that pertains to a tendency to construct dynamic expectations (i.e., mental scenarios) of negative events as progressively increasing in danger and rapidly escalating in risk. The present study tested the hypothesis that looming vulnerability to contamination (i.e., looming of contamination) and generalized looming vulnerability would be positively related to contamination fears commonly observed in obsessive compulsive disorder (OCD) even when controlling for other vulnerabilities such as negative affectivity, anxiety sensitivity, and appraisals of potential for harm. The results support the predictions that both generalized looming vulnerability and looming of contamination are independently associated with contamination fears. Examination of the specificity of the ‘growing’ and ‘spreading’ aspects of contamination looming revealed that these components did not independently predict contamination fears beyond the additional vulnerabilities, supporting the consideration of a total looming of contamination construct rather than independent examination of its components. The implications of these findings for the conceptualization and treatment of contamination-based OCD are discussed.

Keywords Looming vulnerability · Contamination fear · OCD · Anxiety

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Introduction

Current cognitive theories of anxiety suggest that obsessions are related to exaggerated appraisals of threat (e.g., Obsessive Compulsive Cognitions Working Group 1997). For a large portion of individuals with obsessive compulsive disorder (OCD), these exaggerated appraisals of threat take the form of contamination fears. Contamination fear is related to feelings of having been polluted or infected as a result of contact with an object perceived to be soiled, impure, infectious, or harmful (Rachman 2004) and are the most prominent concerns reported by OCD patients (Rasmussen and Tsuang 1986; Stekette et al. 1985). In addition, fear of contamination among OCD patients is strongly related to acts of compulsive washing (Muris et al. 2000; Woody and Tolin 2002). Specifically, perceived contact with a contaminant leads to fear and distress which is frequently followed by attempts to alleviate distress by compulsive washing (Rachman 2004; Hodgson and Rachman 1977; Leckman et al. 1997).

Looming Model of Vulnerability

Past research has indicated that *looming vulnerability*, the perception of threat as rapidly approaching and intensifying, may play a role in the development of OCD (Riskind et al. 1997b; Riskind et al. 2007). According to the looming vulnerability model (Riskind 1997; Riskind et al. 2000), the perception of the *dynamic* nature of threat contributes to the development of anxiety-related disorders. The looming vulnerability model proposes that individuals make mental representations of potentially threatening objects, which allow them to create expectations about potential changes in the severity, the distance between themselves and the threat object, and one’s ability to cope with the potentially

threatening stimulus. Moreover, anxious individuals are believed to have distorted perceptions of threat as rapidly closing in and rising in risk. From an evolutionary perspective, early detection of danger is necessary for self-preservation, as detection of threat movement or escalation is crucial to circumventing harm (Soares and Ohman 1993; Riskind and Williams 2005). Mental representations are posited to place individuals at risk for the development of anxiety when the representations involve chronic, inaccurate perceptions of rapidly intensifying threat or danger that is rapidly approaching in time and space (Riskind 1997; Riskind et al. 2000). The looming vulnerability model assumes that the generation of dynamic appraisals and mental scenarios instigates cognitions (e.g., worry) and activates behavioral responses in preparation for avoiding or evading the threat before impact. However, if the threat is perceived as escalating or intensifying too quickly, it influences the individual's ability to evaluate and select the most appropriate coping strategy. A biased perception of the threat as greater or closer influences the individual to choose more passive and avoidant coping skills, thereby leading to a negative reinforcement pattern.

The looming model differs from other cognitive models (e.g., Beck and Clark 1997) that focus on *static* perceptions of threat (e.g., harm appraisals based on the odds of harm) and do not consider the dynamic contingencies of threat such as its velocity and/or rate of change. While dynamic and static appraisals are related, an individual at any given time may perceive the odds of a future harmful event (e.g., of contamination) as high, medium, or low, without reference to whether the odds are escalating or diminishing with each moment of time (Riskind et al. 2007). Conversely, an individual may see the speed (i.e., velocity or delta) with which the odds of harm are escalating or diminishing as high, medium, or low without reference to the initial odds. Stated differently, cognitive appraisal models have focused on “probability” X “cost” as the major components of harm appraisal. The looming vulnerability model expands on this by adding a component related to the rate of speed of the temporal and spatial progression of threat. Past studies have shown that looming vulnerability is correlated with static expectations, but independently contributes significant, distinct, and unique variance to the prediction of anxiety and relevant variables over and above the effects of static threat content (Riskind et al. 2000; Riskind 1997).

Specifically, cognitive-behavioral models of OCD (e.g., Rachman 1998; Salkovskis 1999) propose that symptoms arise from dysfunctional “obsessive beliefs” such as inflated estimates of threat and responsibility; beliefs about the importance of, and need to control, intrusive thoughts; and perfectionism and intolerance of uncertainty. Subsequently, an individual with contamination-focused OCD symptoms

might perceive potential contaminants as excessively dangerous, may be alarmed by contamination-related thoughts, and may feel a responsibility to engage in specific behaviors to reduce or eliminate the threat of contamination. The looming vulnerability model suggests that individuals high in contamination fears would also view the strength or severity of the contaminant as rapidly increasing and perceive the contaminant as rapidly growing and approaching the individual. These interpretations of the threat add an additional temporal component to the standard probability X cost estimation (Rachman 2007) and are proposed to lead to increased distress and beliefs that coping behaviors (e.g., compulsions or avoidance) need to be implemented as quickly as possible. Supporting the contribution of the looming vulnerability components, Riskind and Rector (2007) found that looming vulnerability themes were significantly associated with OCD symptoms even after controlling for beliefs and appraisals traditionally associated with OCD (i.e., appraisals and interpretations of unwanted, distressing intrusive thoughts, inflated personal responsibility and the tendency to overestimate threat, perfectionism and intolerance of uncertainty, over importance and over control of thoughts). Looming vulnerability also significantly predicts increases in general OCD symptoms over time, even when controlling for intolerance of uncertainty and depression (Riskind et al. 2007).

Looming and Contamination

The looming vulnerability model may have important implications for conceptualizing contamination fears observed in OCD. For individuals high in contamination fears, the threatening stimuli in the looming representations are those associated with disease. Findings indicate that individuals high in contamination fears frequently perceive disgusting objects as rapidly spreading and increasing in threat. A study that assessed interpretations of vignettes describing potentially contaminated objects found that individuals who endorsed subclinical obsessive-compulsive symptoms imagined the situations as more quickly spreading, rapidly approaching, and spreading at a more accelerating rate than participants low in obsessive-compulsive symptoms (Riskind et al. 1997b). The tendency to engage in looming representations has also been shown to discriminate between individuals high in contamination fear, anxious controls, and non-anxious controls, with individuals high in contamination fear reporting the greatest tendency to engage in looming mental representations of feared stimuli (Williams et al. 2006; Tolin et al. 2004). Similar processes have also been observed among OCD patients. For example, Tolin et al. (2004) found that OCD patients reported higher levels of looming vulnerability perception to contamination than panic disorder

patients or non-psychopathology controls. Furthermore, ratings of looming vulnerability mediated the relationship between diagnostic group and a perceived chain of contagion (i.e., failed to recognize a degradation of contamination across objects).

Additional Vulnerabilities for Contamination Fears

The existing literature provides support for the role of looming vulnerability in the development and maintenance of contamination concerns observed in OCD. However, more data are needed to determine whether looming vulnerability offers additional predictive power beyond other established vulnerabilities to anxiety. Anxiety sensitivity and negative affect are two additional vulnerabilities that have received support as predictors of contamination fears. Indeed, anxiety sensitivity has been found to be significantly correlated with contamination fears (Cisler et al. 2007; Olatunji et al. 2005) and general OCD symptoms (Norton et al. 2005). In addition, anxiety sensitivity is a significant predictor of contamination fears both independently (Olatunji et al. 2007) and in conjunction with disgust sensitivity (Cisler et al. 2007). Negative affect has also been found to correlate significantly with general OCD symptoms (Norton et al. 2005). Furthermore, when compared to controls, individuals high in obsessive–compulsive symptoms endorse significantly higher levels of negative affect (Olatunji et al. 2007; Abramowitz et al. 2003). The simultaneous examination of existing vulnerabilities for anxiety-related conditions is needed to determine the extent to which looming vulnerability is a unique predictor in the development and maintenance of symptoms of OCD.

Present Study

The primary aim of the present study was to examine the unique contribution of looming vulnerability, beyond the effects of anxiety sensitivity and negative affectivity, in the prediction of contamination fears. Looming vulnerability was hypothesized to contribute to the prediction of contamination fear beyond the effects of anxiety sensitivity and negative affect. Second, the present study examined the relations between a contamination specific model of looming vulnerability (i.e., looming of contamination) while controlling for associations with anxiety sensitivity, negative affectivity, and general looming vulnerability. The increased specificity of this assessment of the looming vulnerability model was predicted to be associated with contamination fear beyond the effects of anxiety sensitivity, negative affect, perceived likelihood of harm, and the general looming model. Finally, in addition to a composite measure, the current study distinguishes between two dimensions of looming of contamination: the (1) *spread* of

contamination and germs from the original site of contamination, and the (2) *rapid growth* of germs. While previous studies have provided support for the relation between the perceived spread of contaminants and contamination fears, the perceived growth of contaminants has not been examined previously. It was predicted that both of the dimensions of looming vulnerability would serve as significant predictors of contamination fears.

Method

Participants and Procedure

The participants were 194 college students (approximately 71% female) with a mean age of 23.61 ($sd = 7.42$) from George Mason University. The participants assembled in small groups of 10–25 persons and completed a questionnaire battery that included the following measures.

Materials

The *Looming Maladaptive Style Questionnaire* (LMSQ; Riskind et al. 2000) was used as a measure of level of general looming vulnerability, or the tendency to generate dynamic mental representations of potentially threatening situations that are perceived as increasingly threatening or dangerous. Participants are asked to read six brief vignettes and answer four questions about the characteristics of the scene they imagined [e.g., (for a car engine difficulty scenario) “How worried or anxious does your imagining this scene make you feel? In this scene, are the chances of your having a difficulty with the car’s engine decreasing, or increasing and expanding with each moment? Is the level of threat to you from the car’s engine staying fairly constant, or is it growing rapidly larger with each passing moment? How much do you visualize your car’s engine as in the act of progressively worsening?”] using a five point (i.e., 1–5) Likert scale, with higher numbers representing higher looming characteristics. The vignettes describe three social threat (e.g., romantic rejection) and three physical threat (e.g., automobile accidents) situations. A total score is calculated by aggregating responses to the last three items (the first item for each scenario, assessing anxiety, is not included in the total score) across the vignettes yielding a range of 18–90. Riskind et al. (2000) provided evidence for the predictive, convergent, and discriminant validity of the measure, as well as its internal consistency, and the test–retest stability (Riskind and Williams 2005).

The *Anxiety Sensitivity Index* (ASI; Reiss et al. 1986) is a 16-item measure that assesses the fear of anxiety symptoms. Participants are asked to read statements, such as “It scares me when I am nervous”, and indicate on a five point

Likert scale (0 = “very little” to 4 = “very much”) how true the statement is for them. A total score is calculated by summing all 16 items, with higher scores reflecting greater discomfort. Psychometric evaluations of the ASI in college populations suggest good internal consistency for the ASI, with reported Cronbach’s Alpha at .88 (Peterson and Heilbrunner 1987) and .82 (Telch et al. 1989), respectively.

The *Positive and Negative Affect Scale* (PANAS; Watson et al. 1988) is a 10-item measure of negative affectivity. Participants are presented with a list of emotion words (e.g., afraid, guilty) and asked to indicate on a five-point Likert scale to what extent they have experienced the emotion in the past week (ranging from 1 = “very slightly or not at all” to 5 = “extremely”).

The *Padua Inventory-Washington State University Revision* (PI-WSUR; Burns et al. 1996) contamination subscale consists of ten items assessing contamination obsessions (e.g., “I feel my hands are dirty when I touch money”) and washing compulsions (“I wash my hands more often and longer than necessary”). In the present study, items from the PI were scored with a true–false (1, 0) format to increase the likelihood that participants would respond to the items quickly and with minimal deliberative reflection. Riskind and colleagues (2007) demonstrated evidence of internal consistency and validity for this method of scoring. Total scores were calculated for the 10 contamination items, resulting in a range of 0–10. Unfortunately, internal consistency for the contamination subscale in the present study was low, but approached acceptable levels (see Table 1).

Table 1 Bivariate correlations between fear of contamination, anxiety sensitivity, negative affect, harm potential, looming of contamination, and general looming vulnerability

	1	2	3	4	5	6
1. ASI	.84	.29**	.45**	.11	.12	.26**
2. PANAS-NA		.91	.06	.04	.04	.18*
3. LMSQ			.93	.19**	.26**	.31**
4. Harm				.84	.56**	.38**
5. LMC					.89	.38**
6. PI-Contamination						.69
Mean	20.18	18.14	59.98	3.51	10.67	3.51
Standard Deviation	10.63	7.94	13.84	2.33	5.67	2.33

Note * = $p < .05$, ** = $p < .01$. Reliability analyses (α 's) are presented in the diagonal. ASI Anxiety Sensitivity Index total score, PANAS-NA Positive and Negative Affect Scale- Negative Affect subscale total, LMSQ Looming Maladaptive Style Questionnaire total, Harm perceived likelihood of harm total from the contamination scenario-based questionnaire, LMC looming of contamination total from the contamination scenario-based questionnaire, PI-Contamination Padua Inventory-contamination subscale total

The *Contamination Scenario-Based Questionnaire* was developed for the present study. The questionnaire was designed by the second author (J.R.) based on current theories of OCD and looming vulnerability. The questionnaire displayed a picture of a repellent contamination scene (i.e., trash) and included questions that assessed fears and disgust of contamination, the perceived harm potential of the contaminants and the subjective sense of looming vulnerability to the contamination. Two subscales were calculated from this measure. First, the perceived likelihood of harm subscale was computed by summing two items on a seven-point Likert scale (1–7; i.e., How possible or likely is it that these germs or bacteria will harm you?; How possible or likely is it that these germs or bacteria will make you sick?). Second, items on the contamination scenario-based questionnaire were also used to create looming of contamination scores. The looming of contamination items included four questions, two which assessed the perceived spreading (“How slow or fast do you imagine the germs or bacteria as moving toward you? How much do you imagine that the germs and bacteria are actively and energetically moving towards you?”) and two that assessed the perceived growing (Is it your impression that the level of germs or bacteria is rapidly increasing the longer you stay in the room? After you have been in the room for 10 min, how much will the bacteria and germs have increased?). Analyses that utilized the total looming of contamination variable included responses to all four items. All items were scored on a seven point Likert scale (1 = not at all, 7 = very much; looming of contamination range 4–28). Pearson correlation analyses revealed that the looming of contamination spreading and growing subscales were significantly correlated with each other ($r = .64$, $p < .01$). As presented in Table 1, the looming of contamination subscale demonstrated good internal consistency. Similarly, both the spreading ($\alpha = .95$) and growing ($\alpha = .85$) components of looming of contamination also evidenced good internal consistency.

Results

Correlations between Variables

As presented in Table 1, Pearson correlation statistics revealed that contamination fear (as measured by the contamination subscale of the PI-WSUR) was significantly correlated with all the measures of vulnerability to anxiety. Specifically, fear of contamination was moderately correlated with the measure of looming of contamination, the measure of looming vulnerability as a general cognitive style, and the perceived likelihood of harm. Level of fear of contamination was also modestly correlated with anxiety sensitivity and negative affectivity.

General Looming Style and Looming of Contamination as Predictors of Contamination Fears

Next, hierarchical regression analyses were conducted to examine whether looming vulnerability as a general cognitive style and looming of contamination uniquely contributed to the prediction of fear of contamination (measured by the contamination subscale of the PI-WSUR). A four step regression equation was conducted predicting fear of contamination: (1) anxiety sensitivity and negative affectivity were entered in the first step; (2) ratings for the harm potential of contaminants in the second step; (3) ratings for generalized looming vulnerability were included in the third step; and (4) ratings for looming of contamination were entered in the fourth step. As depicted in Table 2, the results of these hierarchical regressions were largely consistent with hypotheses. In the first step, anxiety sensitivity served as a significant predictor of contamination fears. Negative affect did not emerge as a significant predictor of contamination fear. Consistent with traditional theories of anxiety, potential for harm served as a significant predictor of contamination fears, despite controlling for negative affect and anxiety sensitivity. However, generalized

looming vulnerability served as a significant predictor of contamination fear even while controlling for potential for harm, negative affect, and anxiety sensitivity. In addition, the strength of the relation between potential for harm and contamination fears declines when looming vulnerability is included in the equation (potential for harm β step 2 = .35, β step 3 = .32). Finally, supporting a specialized OCD-specific looming vulnerability model, the looming of contamination factors served as a significant predictor in the final step of the regression equation.

Test of the Distinct Effects of “Spreading,” and “Growing”

The total looming of contamination score used in previous analyses was a combination of scores from two looming of contamination subscales: the (1) spreading and (2) growing of contamination. A second series of hierarchical regression analyses was conducted to determine whether the specific components of spreading and growing subparts to looming of contamination independently contribute to the prediction of contamination fears. The regression equation was identical to the prior equation, with the exception of the splitting of the looming of contamination variable into two variables (i.e., spreading and growing). Thus, the regression equation included: (1) anxiety sensitivity and negative affectivity in the first step; (2) ratings for the harm potential of contaminants in the second step; (3) general looming vulnerability in the third step; and (4) ratings for the perception of the spreading and growing of contamination in the final step. The looming contamination factors in the final step together significantly contributed to the prediction of contamination fear ($\Delta R^2 = .03$ for Step 4, $p < .05$), but neither the spreading ($B = .04$, $SEB = .07$, $\beta = .06$, $p = .53$) nor the growing ($B = .11$, $SEB = .06$, $\beta = .15$, $p = .08$) component was individually revealed as a unique or distinct significant predictor.

Table 2 Regression of fear of contamination on anxiety vulnerabilities

Variable	<i>B</i>	SEB	β
Step 1			
ASI total	.05	.02	.22**
PANAS-NA total	.03	.02	.11
Step 2			
ASI total	.04	.02	.20**
PANAS-NA total	.03	.02	.10
Harm total	.29	.05	.35**
Step 3			
ASI total	.02	.02	.11
PANAS-NA total	.04	.02	.12
Harm total	.27	.05	.32**
LMSQ total	.03	.01	.19*
Step 4			
ASI total	.02	.02	.11
PANAS-NA total	.04	.02	.12
Harm total	.18	.06	.22**
LMSQ total	.03	.01	.16*
Looming of contamination total	.08	.03	.19*

Note $R^2 = .08$ for Step 1; $\Delta R^2 = .12$ for Step 2 ($p < .01$); $\Delta R^2 = .03$ for Step 3 ($p < .05$); $\Delta R^2 = .02$ for Step 4 ($p < .05$). *ASI* Anxiety Sensitivity Index total score, *PANAS-NA* Positive and Negative Affect Scale- Negative Affect subscale total, *LMSQ* Looming Maladaptive Style Questionnaire total, *Harm* Perceived likelihood of harm total from the contamination scenario-based questionnaire

Discussion

The looming vulnerability model suggests that in addition to components of traditional conceptualizations of OCD (i.e., static perceptions of threat), perceptions of contaminants as rapidly increasing in threat, expanding, and approaching the individual contribute to an individual's contamination-related anxious symptoms. Previous findings have demonstrated associations between contamination fears and perceptions of disgusting objects as rapidly spreading and increasing in threat in college students (Dorfin and Woody 2006; Riskind et al. 1997a). The tendency to engage in looming representations has also been shown to discriminate between individuals high in

contamination fear, anxious controls, and non-anxious controls (Williams et al. 2006). Looming vulnerability has also been associated with increases in general OCD symptoms over time (Riskind et al. 2007). However, other vulnerabilities to anxiety, including negative affect and anxiety sensitivity, have also demonstrated associations with contamination fears and OCD symptoms (Cisler et al. 2007; Olatunji et al. 2005; Olatunji et al. 2007; Norton et al. 2005). The present study examined the strength of the relation between looming vulnerability and contamination fears by controlling for additional previously established vulnerabilities for anxiety (i.e., static perceptions of threat, negative affect, and anxiety sensitivity). To test the utility of examining threat specific looming vulnerability tendencies, the present study assessed perceptions of looming vulnerability characteristics in contamination specific scenarios (i.e., looming of contamination).

Examination of the general vulnerabilities to anxiety revealed that anxiety sensitivity and perception of harm significantly predicted contaminations fears, while negative affect did not. Consistent with predictions, generalized looming vulnerability served as a significant predictor of contamination fears, even while controlling for the influence of anxiety sensitivity, negative affect, and perceived likelihood of harm. While the perception of likelihood of harm remained a significant predictor of contamination fears in all analyses, anxiety sensitivity failed to significantly predict contamination fears when the effects of looming vulnerability were included in the model. In addition to the general model, the present study examined the influence of contamination specific looming characteristics. Consistent with the general looming model, looming of contamination significantly incremented the prediction of level of contamination fears while controlling for negative affect, anxiety sensitivity, and perceived likelihood of harm. Furthermore, looming of contamination predicted level of contamination fears even while controlling for general looming vulnerability. These findings suggest that the assessment of threat-specific looming interpretations may be helpful in addition to consideration of an individual's general tendency to possess looming consistent interpretations.

The present study also examined the unique contributions of both the spreading and growing aspects of looming vulnerability to contamination. Prior studies have found support for the association between looming vulnerability as a whole (i.e., perceived increase in risk and approach of the threatening stimuli) and contamination fears (e.g., Riskind et al. 1997a). However, support has also been found for the independent contribution of the perceived approach, or spreading, of contamination. For example, Tolin et al. (2004) demonstrated that individuals high in contamination fears view contamination as capable of

spreading across objects without a reduction in the level of threat. While the present study did find that the total looming of contamination score was a significant predictor of contamination fears, neither the spreading nor the growing component individually served as a significant predictor of contamination fears. These findings suggest that differentiating between the spreading and growing perceptions may not be a meaningful distinction, but rather that the components may be more meaningful when considered together within the looming construct.

The results of the present study imply that contamination fears are associated with a sense of a looming vulnerability. Contamination fearful individuals may create fearsome dynamic images of germs as rapidly mounting in risk and danger, as opposed to a snap-shot of unchanging threat in a suspended moment. Manipulations of mental imagery associated with different levels of motion or dynamic looming perception of contaminants have been associated with greater fear of contamination (Dorfin and Woody 2006; Riskind et al. 1997b). For example, Dorfin and Woody (2006) found that college students who were asked to imagine a sterile drop of urine that was placed on their body as moving and spreading were more anxious than those who were asked to imagine the urine as staying in one place. Moreover, individuals asked to imagine urine as moving were likely to become increasingly sensitized rather than habituated to the urine with increasing exposure times (Dorfin and Woody 2006). Inclusion of treatment techniques aimed at modifying distorted perceptions of the spread and growth of contamination may increase the efficacy of treatment for individuals with contamination-related OCD. Indeed, imagination of contaminated stimuli as frozen (rather than looming) has been found to significantly reduce contamination fear and behavioral avoidance among participants high in contamination fear (Riskind et al. 1997).

However, some limitations of the present study should be considered. First, study participants were unselected undergraduate students, not individuals high in contamination fears. Consistent with this, the mean contamination fear score for the sample fell on the lower end of the range (range, 0–10; $M = 3.51$). Additionally, a modified version of the Padua Inventory contamination subscale, with dichotomous items, was used in the present study. This variation from the standard format makes it difficult to compare the current sample's level of contamination fears to most previous studies. Furthermore, the internal consistency of the contamination items utilized in the present study was lower than desired. Although past results suggest that the relation between looming and contamination fears is present in both clinical (Tolin et al. 2004; Riskind and Rector 2007) and subclinical samples (Dorfin and Woody 2006; Riskind et al. 1997b; Tolin et al. 2004), additional

research with OCD patients is needed. Second, all information in the current study was obtained using self-report questionnaires. Future multi-method studies in clinical samples could test the applicability of the looming vulnerability model to the conceptualization and treatment of contamination-based OCD. Additional studies using experimental methods to examine relations between looming vulnerability and looming-consistent concepts, such as the sympathetic magic study (i.e., perception of a spread of contamination across objects) conducted by Tolin et al. (2004), could be used to gain a better understanding of how looming vulnerability properties manifest in individuals with contamination related OCD. Additional examination of the application of strategies derived from the looming vulnerability model to treatments, such as the use of the visualization of contaminants as frozen (Riskind et al. 1997b), could provide information about the potential clinical utility of looming vulnerability. Studies using both self-report assessment of looming vulnerability and behavioral tasks, such as behavioral avoidance tasks, could also provide additional support for the looming vulnerability construct. Finally, it should be noted that the significant findings reported generally accounted for small amounts of variance in the prediction of contamination fears. However, the findings of the current study are conservative, given that the analyses controlled for the effects of the additional vulnerabilities. In combination with past research indicating that looming vulnerability has effects beyond those of static perceptions (Riskind et al. 2000; Riskind 1997), the present findings highlight the importance of considering the dynamic nature of the perceived threat progression in relation to contamination fears.

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