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Anxiety sensitivity and affect regulatory strategies: Individual and interactive risk factors for anxiety-related symptoms

Todd B. Kashdan [a,*], Michael J. Zvolensky [b], Alison C. McLeish [c]

[a] *Department of Psychology, MS 3F5, George Mason University, Fairfax, VA 22030, United States*
[b] *The University of Vermont, United States*
[c] *University of Mississippi Medical Center, United States*

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Abstract

Studies have shown that anxiety sensitivity (AS) is a risk factor in the development of pathological anxiety. Recent theoretical models emphasize the additional importance of how people handle their anxious experiences. The present study examined whether high AS and being fixated on the control and regulation of unwanted anxious feelings or being unable to properly modulate affect as needed lead to particularly problematic outcomes. We examined the interactive influence of AS and affect regulatory strategies on the frequency and intensity of anxiety symptoms. Questionnaires were completed by 248 young adults in the community. Results showed a general pattern with anxiety symptoms being the most severe when high AS was paired with affect regulatory difficulties. Of participants high in AS, anxious arousal and worry were heightened in the presence of less acceptance of emotional distress; anxious arousal, worry, and agoraphobic cognitions were heightened when fewer resources were available to properly modulate affect; and agoraphobic cognitions were heightened in the presence of high emotion expressiveness. As evidence of construct specificity, an alternative model with anhedonic depressive symptoms as a main effect and interaction effect (with regulatory strategies) failed to predict anxiety symptoms. However, anxiety sensitivity and less acceptance of emotional distress were associated with greater anhedonia. Results are discussed in the context of how and when affect regulatory behavior shifts individuals from normative anxiety to pathology.

Keywords: Anxiety sensitivity; Emotion regulation; Worry; Acceptance; Approach coping; Self-regulation

Researchers have made great strides in conceptualizing and measuring emotion vulnerabilities that contribute to the development of human suffering generally and anxiety psychopathology specifically. A vulnerability factor that has received a great deal of scholarly attention in contemporary work on anxiety and its disorders is anxiety sensitivity (fear of anxiety and its sensations; McNally, 2002). Indeed, extant research suggests that anxiety sensitivity may be usefully conceptualized as a variable risk factor for anxiety problems (Taylor, 1999; Zvolensky, Schmidt, Bernstein, & Keough, 2006). This cognitive factor increases the risk for the subsequent development of anxiety symptoms, unexpected panic attacks, as well as anxiety psychopathology (e.g., panic disorder; Ehlers, 1995; Hayward, Killen, Kraemer, & Taylor, 2000; Maller & Reiss, 1992; Schmidt, Lerew, & Jackson, 1997, 1999; Schmidt, Zvolensky, & Maner, 2006).

* Corresponding author. Tel.: +1 703 993 9486; fax: +1 703 993 1359.
E-mail address: tkashdan@gmu.edu (T.B. Kashdan).
URL: http://mason.gmu.edu/~tkashdan

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Other work suggests that anxiety sensitivity is uniquely related to escape and avoidance behavior (Stewart, Peterson, & Pihl, 1995; Zvolensky et al., 2004; Zvolensky & Forsyth, 2002). These data collectively indicate that for individuals with higher levels of anxiety sensitivity, their outcome expectations can serve to increase (1) fears about experiencing anxiety (anticipatory stage), (2) anxious arousal, and (3) the subsequent use of cognitive or behavioral strategies to escape internal sensations.

To date, scientific activity on anxiety sensitivity has principally been focused on ''main effect'' types of questions. Though this type of approach is a useful starting point given the developmental nature of the literature, the manner in which anxiety sensitivity may interplay with other processes relevant to anxiety psychopathology is less well documented. Such neglect is unfortunate, as there is a growing recognition that how individuals regulate emotional experiences, particularly whether they accept or avoid emotional experiences, is critical in understanding how anxious and fearful responding is maintained and exacerbated (Gross, 1999; Kashdan & Steger, 2006; Zvolensky, Feldner, Leen-Feldner, & Yartz, 2005). Numerous scholars have, in fact, suggested that the role of emotional vulnerabilities like anxiety sensitivity may be more complex than linear main effect models (Hayes & Feldman, 2004; Zvolensky, Feldner et al., 2005). This general perspective sits on the backdrop of the recognition that affect regulation processes may play a formative role in the etiology and maintenance of anxiety and its disorders (Mennin, 2005). Specifically, some scholars have suggested that whether or not anxiety sensitivity ultimately ''leads'' to anxiety psychopathology may depend, at least in part, on how people monitor and manage the physical, cognitive, and behavioral manifestations of anxiety and the situations that elicit such states (Eifert & Forsyth, 2005; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996).

Interestingly, to the extent an individual can ''tolerate'' negative affect states and cognitions (without the need to change or escape them), it is not fully clear that the presence of high anxiety sensitivity would be as problematic (Brown, Lejuez, Kahler, Strong, & Zvolensky, 2005). For example, insofar as people high in anxiety sensitivity emotionally accept aversive anxious states or thoughts, they may be able to forestall escalation of problematic anxiety experiences. Specifically, affect regulatory variables such as emotional acceptance may, theoretically, permit emotionally vulnerable people to attend to the current situation, thereby gaining a more objective perception of the level of personal threat, rather than reacting to it in an excessively anxiety-relevant manner (e.g., catastrophizing). This type of perspective is generally predicted by theoretical models and intervention strategies that attempt to modify anxiety and other emotional disturbances by changing one's response to such anxiety states and life events (Hayes, 2002; Hayes et al., 2006; Orsillo & Roemer, 2005; Roemer & Orsillo, 2002).

Though the empirical database is limited in overall scope, there is some evidence to support explorations of the interactive effects of affect regulatory variables and anxiety sensitivity. Using a laboratory approach, anxiety sensitivity interacted with emotional suppression to delay affective recovery from an anxiety-relevant laboratory stressor (Feldner, Zvolensky, Stickle, Bonn-Miller, & Leen-Feldner, 2006). Such findings support other work suggesting emotional suppression may be problematic for anxiety sensitive females (Eifert & Heffner, 2003) and persons with panic disorder (Campbell-Sills, Barlow, Brown, & Hofmann, 2006). In a more recent study, Vujanovic, Zvolensky, Bernstein, Feldner, and McLeish (in press) found that individuals high in anxiety sensitivity reported fewer anxiety symptoms when they also were high, but not low, in mindful attention (defined as attention to, and awareness of, what is occurring in the present; Brown & Ryan, 2003). Though such data is generally in accord with self-regulatory models of anxiety (Kashdan, 2007; Mennin, 2005; Wells, 2000), empirical data that more comprehensively document such matters with affect regulatory variables are not currently available. Building from past theory and research, it would be clinically important and theoretically useful to examine whether when people scoring high in anxiety sensitivity are unwilling to accept and experience the inevitable and natural occurrence of anxiety-related states, they are more apt to show greater vulnerability to excessive and impairing anxiety-related symptoms (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

As another affect regulatory variable, there is reason to believe that the willingness to openly express emotions is an important determinant of whether anxiety sensitivity is related to greater levels of anxiety symptoms. While emotional expression is often an effective coping strategy to cope with stress and thrive in meaningful life domains (e.g., interpersonal relationships), these benefits may be compromised in people with particular vulnerabilities. That is, the costs and benefits of strategically expressing emotions may differ as a function of people's dispositional tendencies.

Theory and research suggest two competing models on how emotional expression can operate in people with high anxiety sensitivity. In the first model, it can be hypothesized that high anxiety sensitivity, in conjunction with high emotional expression, leads to emotion disturbances. This hypothesis is driven by the perspective that the open, behavioral expression of emotions can be maladaptive in people who are burdened by frequent and intense emotional distress and negative feelings and thoughts about these reactions. For example, the frequent expression of intense negative emotions and thoughts can exhaust social supports such that excessive needs for reassurance and care-taking eventually elicit rejection (Kashdan, Volkmann, Breen, & Han, in press; Kennedy-Moore & Watson, 2001). These negative social consequences can serve to intensity already elevated negative internal reactions. In an alternative model, it can be hypothesized that high anxiety sensitivity, in conjunction with minimal emotional expression, can lead to emotional disturbances. This perspective derives from research suggesting there is a rebound effect for people attempting to strategically inhibit or hide overt signs of internal, negative emotional states (see Gross, 1999; Hayes et al., 2006 for reviews). That is, people trying to hide or conceal thoughts, feelings, and images show a paradoxical increase in the emotional material they are trying to avoid. More emotionally vulnerable people may demonstrate greater rebound effects following attempts to inhibit their emotional expression.

The global aim of the present investigation was to evaluate the interactive nature between anxiety sensitivity and theoretically relevant affect-related regulation variables. People with high anxiety sensitivity were expected to vary in their willingness to experience and flexibly adapt to negative emotions in the service of situational demands and personal goals. The degree of anxiety-related distress associated with high anxiety sensitivity was proposed to be amplified when people over-relied on regulatory strategies that increased the difficulty of modulating emotions. Anxiety-related outcomes were operationalized by high anxious arousal, excessive and uncontrollable worry, and excessive agoraphobic cognitions. Each of these constructs is a central diagnostic feature of numerous types of anxiety psychopathology. First, it was hypothesized that individuals high in anxiety sensitivity endorsing less rather than more ability to accept emotional reactions would demonstrate the most anxiety-related symptoms. Second, it was hypothesized that individuals high in anxiety sensitivity who also believed that they could not effectively access strategies to cope with unwanted emotional states would demonstrate particularly elevated anxiety-related symptoms. In essence, this regulatory strategy is a combination of an unwillingness to accept emotional states and subsequent beliefs that little that can be done to change these undesirable states. Third, we tested competing models of whether more or less intentional emotional expression in the context of high anxiety sensitivity would lead to the greatest anxiety-related symptoms. Finally, to test the specificity of predictions on anxiety-related symptoms, the effects of anxiety sensitivity and affect regulatory variables were examined on anhedonic depressive symptoms. There has been minimal research on the relevance of anxiety sensitivity and particular affect regulatory strategies on negative mood states other than anxiety. Here, we theorized that the mechanisms and interactive models under study would be conceptually specific to anxiety-related states.

1. Method

1.1. Participants

The sample consisted of 248 young adults (136 females; $M_{age} = 22.41$ years, S.D. = 7.94) recruited through the general community in Vermont via advertising using flyers displayed in a local well-traveled marketplace, local restaurants, bars, and university-based bulletin boards. The racial composition of the studied sample reflected that of the local population (State of Vermont Department of Health, 2000): approximately 93.1% of the sample was Caucasian, 2.4% African-American, 1.2% Hispanic, 1.6% Asian American, and 1.6% other. Approximately 5.2% of the sample had at least a 4-year college education, 45.6% had some college education, 46% had a high school degree or the equivalent, 2.8% did not have a high school education, and 0.4% did not respond to this item. Participants were excluded from the study if they displayed limited mental competency or the inability to give informed, written consent. Mental competency was assessed by insuring that the participant was oriented to time and place.

1.2. Measures

1.2.1. Anxiety sensitivity index (ASI)

The ASI (Reiss, Peterson, Gursky, & McNally, 1986) is a 16-item measure that asks respondents to rate on a 5-point Likert scale (0 = *very little* to 4 = *very much*) the degree to which they fear negative consequences stemming from anxiety symptoms. Responses to each

item are summed to provide a total score from 0 to 64. Previous research indicates that the ASI is made up of one higher-order factor (ASI Total Score) and three lower-order factors: Physical, Psychological, and Social Concerns (Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004; Stewart, Taylor, & Baker, 1997; Zinbarg, Barlow, & Brown, 1997). The ASI shows adequate test–retest reliability ($r = .75$ for 2 weeks), criterion validity (e.g., individuals with agoraphobia score higher than those with other anxiety disorders and those with no disorder), and is distinct from trait anxiety (Reiss et al., 1986). In the present investigation, we utilized the total ASI score, as it represents the global-order anxiety sensitivity factor and therefore takes into consideration different types of fears, including fears of panic-related somatic, cognitive, and social cues.

1.2.2. Penn State Worry Questionnaire (PSWQ)

The PSWQ is a 16-item measure of pathological worry that assesses three areas of worry: generality, excessiveness, and uncontrollability (Meyer, Miller, Metzger, & Borkovec, 1990). Items are rated on a 5-point Likert scale from (1) *not at all typical* to (5) *very typical*. Total scores range from 16 to 80 with higher scores indicating greater levels of worry. The PSWQ is able to distinguish individuals with generalized anxiety disorder from other anxiety disorders (e.g., social anxiety disorder and posttraumatic stress disorder; Brown, Antony, & Barlow, 1992; Fresco, Mennin, Heimberg, & Turk, 2003; Meyer et al., 1990) and has high internal consistency and good test-rested reliability (Meyer et al., 1990).

1.2.3. Agoraphobic Cognitions Questionnaire (ACQ)

The ACQ is a 14-item scale measuring the frequency of catastrophic thoughts during the experience of anxiety and fear (Chambless, Caputo, Bright, & Gallagher, 1984). Items are rated on a 5-point Likert scale from (1) *thought never occurs* to (5) *thought always occurs*. The ACQ is comprised of two factors: social/behavioral concerns and physical concerns. The ACQ has been shown to have high internal consistency (Cronbach alpha = .87), moderate test–retest reliability ($r = .67$ for 1 month) and sensitivity to changes due to treatment (Chambless et al., 1984). The ACQ can also discriminate clinical from non-clinical groups, especially individuals with anxiety disorders (Chambless & Gracely, 1989). As in past research (Zvolensky, Bonn-Miller et al., 2006), the ACQ total score was used to index anxiety-related cognitions (a criterion variable).

1.2.4. Mood and Anxiety Symptom Questionnaire (MASQ)

The MASQ is a comprehensive measure of affective symptoms with well-established psychometric properties (see Watson et al., 1995, for details). Participants indicate how much they have experienced each symptom from 1 (*not at all*) to 5 (*extremely*). The Anxious Arousal scale (MASQ-AA) is a 17-item scale that measures the symptoms of somatic tension and arousal (e.g., ''felt dizzy''). The Anhedonic Depression scale (MASQ-AD) is a 22-item scale that measures a loss of interest in life (e.g., ''felt nothing was enjoyable'') and reverse-keyed items measuring positive affect. As in past work (Zvolensky, Kotov, Antipova, & Schmidt, 2005), only the MASQ-AA and MASQ-AD subscales were used in the present investigation, as opposed to the general distress depressive symptoms and general distress anxiety symptoms subscales. The MASQ-AA and MASQ-AD subscales provide empirically sound and specific composites for ''pure'' anxiety and ''pure'' depression symptoms, respectively (Watson et al., 1995). The alpha for the anxious arousal scale in the present sample was .91 and the anhedonic depressive subscale was .89.

1.2.5. Difficulties in Emotion Regulation Scale (DERS)

The DERS is a 36-item measure of six dimensions of affect regulation (Gratz & Roemer, 2004). Items are rated on a 5-point Likert scale from (1) *almost never applies to me* to (5) *almost always applies to me*. The dimensions of affect regulation assessed include non-acceptance of emotional responses (''When I'm upset, I feel guilty for feeling that way''), limited access to emotion regulation strategies (''When I'm upset, I believe that I will remain that way for a long time''), difficulties in engaging in goal directed behavior (''When I'm upset, I have difficulty concentrating''), impulse control difficulties (''When I'm upset, I lose control over my behaviors''), lack of emotional awareness (''I care about what I am feeling''—reverse scored), and lack of emotional clarity (''I have difficulty making sense out of my feelings''). Higher scores on these dimensions are indicative of greater difficulties. The DERS has high internal consistency (overall $\alpha = .93$, $\alpha > .80$ for each subscale; Gratz & Roemer, 2004). Only the non-acceptance and limited access to (effective) emotion regulation strategies subscales were used in the present investigation. These subscales contain six items and eight items, respectively. The other scales assess important emotion related constructs but are not face-valid measures of regulatory strategy use per se.

1.2.6. Emotional Approach Coping Questionnaire (EACQ)

The EACQ is an 8-item questionnaire in which respondents indicate, on a 4-point Likert-type scale (1 = *I usually don't do this at all* to 4 = *I usually do this a lot*), their tendency to approach their emotions in response to stressful or difficult situations (Stanton, Kirk, Cameron, & Danoff-Burg, 2000). It measures two factors of emotional approach coping: emotional processing and emotional expression. For this study, our interest was in the emotional expression subscale. Sample items from the emotional expression (EE) subscale include "I let my feelings come out freely" and "I feel free to express my emotions." The emotional expression subscale shows good internal consistency ($\alpha = .82$) and test–retest reliability ($r = .72$; Stanton et al., 2000).

1.3. Procedure

Participants responding to community-based advertisements for the study were scheduled for an individual appointment by a trained research assistant. At this appointment, participants first were presented with a lay summary description of the study and then gave verbal and written consent. Participants then completed the following self-report measures: Anxiety Sensitivity Index, Mood and Anxiety Symptom Questionnaire, Penn State Worry Questionnaire, Agoraphobic Cognitions Questionnaire, Emotional Approach Coping Questionnaire, and Difficulties in Emotion Regulation Scale. These measures were presented in the order listed above for all participants and required approximately 45 min to complete. Upon completion of the study, participants were debriefed regarding the aims of the study and compensated $25 for their efforts.

2. Results

2.1. Preliminary analyses

Means, standard deviations, and internal consistency coefficients for all scales are reported in Table 1. All scales had acceptable psychometric properties.

2.1.1. Anxiety sensitivity and affect regulatory strategies as predictors of anxiety-related symptoms

We conducted a series of hierarchical regression models to examine whether non-acceptance of emotional distress (DERS subscale), limited access to effective regulatory strategies (DERS subscale) or emotional expression (EACQ subscale) moderated the effects of anxiety sensitivity on anxiety outcomes. Anxious arousal (MASQ subscale), worry (PSWQ-total score), and agoraphobic cognitions (ACQ-total score) served as dependent measures of anxiety-related symptoms. After entering main effects, the relevant Anxiety Sensitivity × Regulatory Strategy interaction was entered. Predictor and outcome variables were centered and significant interaction effects were explored with simple slope analyses (see Aiken & West, 1991).

2.1.2. Non-acceptance of emotional distress models

Both anxiety sensitivity and non-acceptance of emotional distress were related to greater anxious arousal, worry, and agoraphobic cognitions (see Table 2). We also found support for non-acceptance of emotional distress as a moderator of the effects of anxiety sensitivity on anxious arousal and worry. With the simple effects plotted in Fig. 1, for high anxiety sensitive individuals, greater non-acceptance was related to greater anxious arousal and worry, respectively.

Table 1
Means, standard deviations, and internal consistency coefficients for, and zero-order relations between all variables

	1	2	3	4	5	6	7	8	M	S.D.	α
1. ASI	–	.52**	.68**	−.06	.62**	.56**	.51**	.50**	20.1	13.1	.93
2. DERS-NA	–	–	.63**	−.26**	.50**	.46**	.40**	.43**	11.5	5.49	.92
3. DERS-S	–	–	–	−.11	.59**	.65**	.46**	.62**	15.2	6.57	.88
4. EACQ-EE	–	–	–	–	.02	−.09	−.06	−.34**	10.4	3.46	.90
5. MASQ-AA	–	–	–	–	–	.44**	.47**	.32**	25.4	8.2	.85
6. PSWQ	–	–	–	–	–	–	.42**	.51**	31.5	16.3	.95
7. ACQ	–	–	–	–	–	–	–	.35**	1.5	0.51	.81
8. MASQ-AD	–	–	–	–	–	–	–	–	54.7	14.1	.90

Note: A double asterisk indicates correlation is significant at .01 level; all *p*-values were two-tailed. ASI: Anxiety Sensitivity Index (Reiss et al., 1986); DERS-NA: Difficulties in Emotion Regulation Scale-Non-acceptance (Gratz & Roemer, 2004); DERS-S: Difficulties in Emotion Regulation Scale-Limited access to emotion regulation strategies (Gratz & Roemer, 2004); EACQ-EE: Emotional Approach Coping Questionnaire-Emotional Expression subscale (Stanton et al., 2000); PSWQ: Penn State Worry Questionnaire (Meyer et al., 1990); MASQ-AA: Mood and Anxiety Symptom Questionnaire- Anxious Arousal subscale (Watson et al., 1995); ACQ: Agoraphobic Cognitions Questionnaire (Chambless et al., 1984); MASQ-AD: Mood and Anxiety Symptom Questionnaire-Anhedonic Depression subscale (Watson et al., 1995).

Table 2
Hierarchical regression models of anxiety sensitivity and the non-acceptance of emotional distress on anxiety-related symptoms

Step		b	S.E.$_b$	β	t	ΔR^2	ΔF
Criterion variable: anxious arousal							
1	AS	.48	.05	.49	8.49***	.42	89.44***
	Non-acceptance	.24	.06	.25	4.39***		
2	AS × non-acceptance	.14	.04	.19	3.62***	.03	13.10***
Criterion variable: worry							
1	AS	.45	.06	.44	7.30***	.36	66.22***
	Non-acceptance	.23	.06	.23	3.80***		
2	AS × non-acceptance	−.09	.04	−.13	−2.17*	.01	4.69*
Criterion variable: agoraphobic cognitions							
1	AS	.40	.07	.40	6.17***	.28	46.27***
	Non-acceptance	.20	.06	.20	3.09**		
2	AS × non-acceptance	.07	.04	.09	1.48	.01	2.18

*N*s = 242–243; + $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

2.1.3. Access to regulation strategies models

Even after accounting for anxiety sensitivity, limited access to effective regulation strategies were related to greater anxious arousal, worry, and agoraphobic cognitions (see Table 3). We also found support for limited access to strategies as a moderator of each anxiety outcome. With the simple effects plotted in Fig. 2, for high anxiety sensitive individuals, less access to strategies was related to greater anxious arousal, worry, and agoraphobic cognitions, respectively.

2.1.4. Emotional expression models

Emotional expression was not related to anxiety outcomes after accounting for anxiety sensitivity

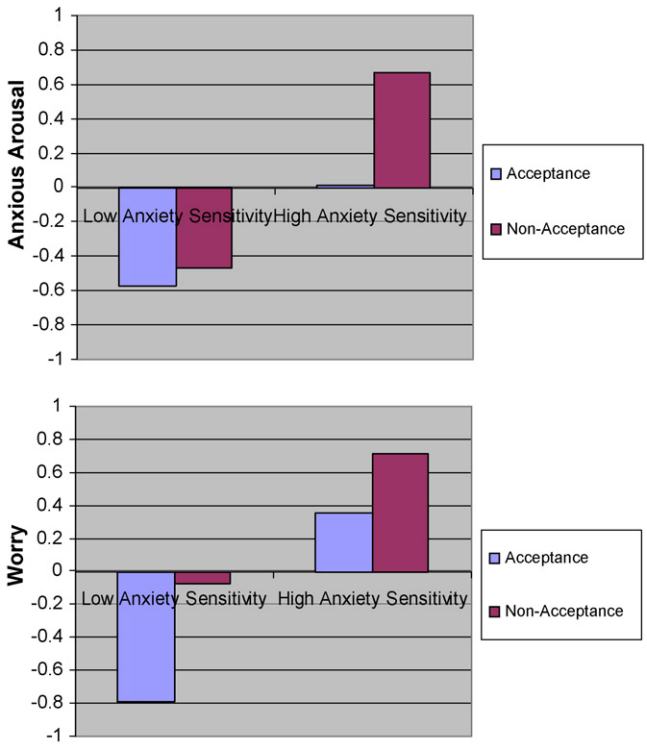

Fig. 1. Anxiety-related symptoms as a function of anxiety sensitivity and non-acceptance of emotional distress. *Notes*: High and low anxiety sensitivity, and more and less non-acceptance, was defined as at least +1 and −1 standard deviations from the mean, respectively.

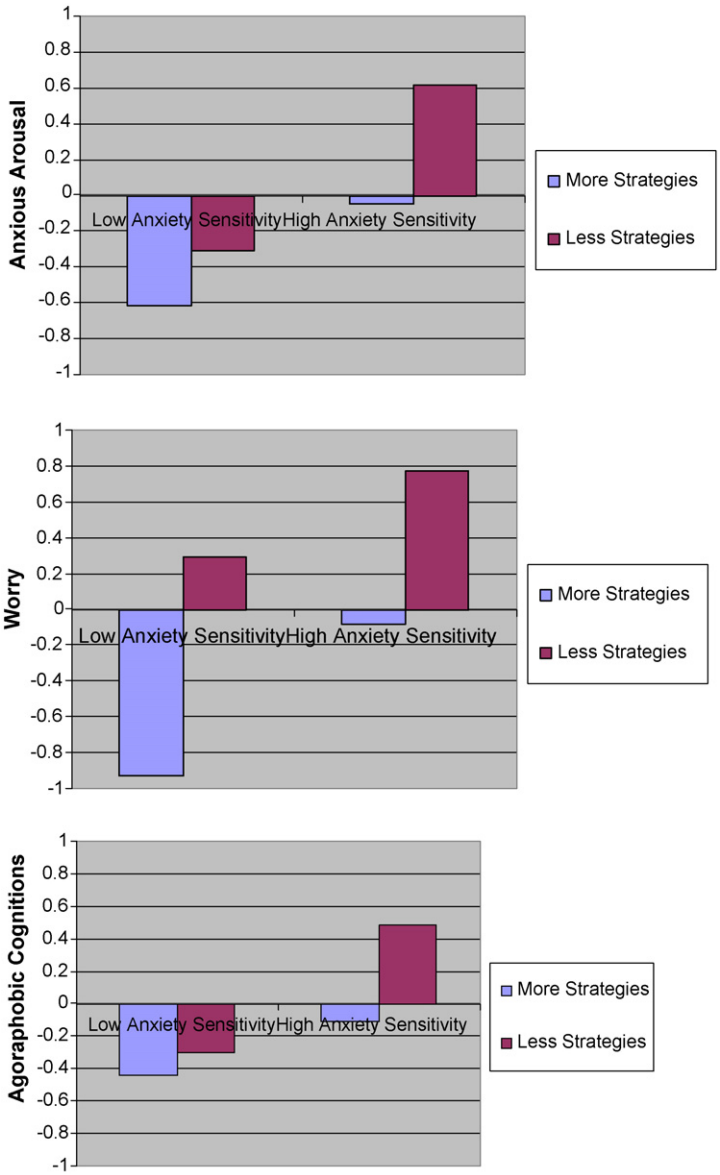

Fig. 2. Anxiety-related symptoms as a function of anxiety sensitivity and access to effective emotion regulation strategies. *Notes*: High and low anxiety sensitivity, and more and less limited access to strategies, was defined as at least +1 and −1 standard deviations from the mean, respectively.

(see Table 4). We found support for emotional expression as a moderator of agoraphobic cognitions. With the simple effects plotted in Fig. 3, for high anxiety sensitive individuals, greater emotional expression was related to greater agoraphobic cognitions whereas for less anxiety sensitive individuals, greater emotional expression was related to less agoraphobic cognitions. Thus, whether high emotional expression had costs or benefits was dependent on anxiety sensitivity levels.

2.2. *Specificity of models to anxiety-related symptoms*

To examine the specificity of prior models to anxiety-related symptoms, we examined anhedonic depressive symptoms as the criterion. As simultaneous predictors in separate models, anxiety sensitivity and each affect regulatory strategy (greater non-acceptance, less access to strategies, less emotional expression) were related to greater anhedonic symptoms, $R^2\Delta = .30$,

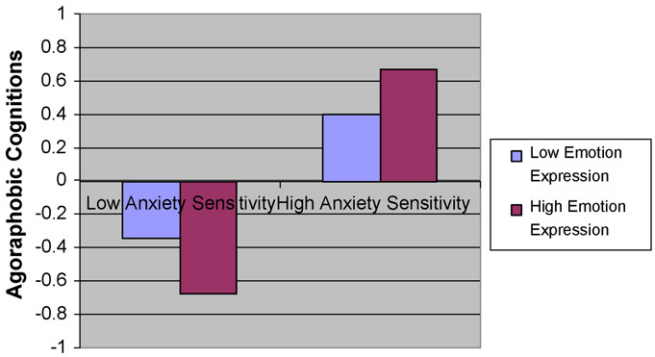

Fig. 3. Anxiety-related symptoms as a function of anxiety sensitivity and emotion expression. *Notes*: High and low anxiety sensitivity, and high and low emotional expression, was defined as at least +1 and −1 standard deviations from the mean, respectively.

Table 3
Hierarchical regression models of anxiety sensitivity and limited access to emotion regulation strategies on anxiety-related symptoms

Step		*b*	S.E.$_b$	β	*t*	ΔR^2	ΔF
Criterion variable: anxious arousal							
1	AS	.40	.07	.42	5.88***	.45	80.74***
	Strategies	.29	.07	.31	4.30***		
2	AS × strategies	.09	.04	.13	2.09*	.01	4.38*
Criterion variable: worry							
1	AS	.30	.07	.29	4.14**	.47	87.90***
	Strategies	.47	.07	.46	6.46***		
2	AS × strategies	−.09	.04	−.13	−2.10*	.01	4.39*
Criterion variable: agoraphobic cognitions							
1	AS	.32	.09	.31	3.68***	.26	34.10***
	Strategies	.25	.09	.25	2.94**		
2	AS × strategies	.11	.05	.16	2.17*	.02	4.70*

*N*s = 198–199; + $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

Table 4
Hierarchical regression models of anxiety sensitivity and emotional expression on anxiety-related symptoms

Step		*b*	S.E.$_b$	β	*t*	ΔR^2	ΔF
Criterion variable: anxious arousal							
1	AS	.59	.05	.61	11.87***	.37	70.61***
	Emotion express	.06	.05	.06	1.20		
2	AS × emotion express	−.06	.05	−.07	−1.29	.00	1.67
Criterion variable: worry							
1	AS	.57	.05	.56	10.54***	.32	56.82***
	Emotion express	−.05	.05	−.05	−.99		
2	AS × emotion express	.01	.05	.01	.15	.00	.02
Criterion variable: agoraphobic cognitions							
1	AS	.51	.06	.50	9.07***	.26	41.63***
	Emotion express	−.03	.06	−.03	−.51		
2	AS × emotion express	.15	.05	.16	2.92**	.03	8.50**

*N*s = 242–244; + $p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$.

.41, and .35, *t*s for anxiety sensitivity = 6.51, 2.51, and 9.27, and *t*s for regulatory strategies = 3.58, 6.60, and −6.05, respectively (all *p*s < .05). However, there was no support for any interactive effects between anxiety sensitivity and regulatory strategies on anhedonic symptoms (*p*s = .68, .95, and .88, respectively).

3. Discussion

There is consistent evidence that anxiety sensitivity is related to excessive anxiety-related symptoms. Scholars have increasingly suggested that whether or not anxiety sensitivity ultimately "leads" to anxiety psychopathology may depend, at least in part, on how people monitor and manage the physical, cognitive, and behavioral manifestations of anxiety and the situations that elicit them (Eifert & Forsyth, 2005; Hayes et al., 1996). The purpose of the present investigation was to concurrently evaluate the interactive nature between anxiety sensitivity and theoretically relevant affect regulatory variables in regard to prototypical anxiety symptoms.

Anxiety sensitivity was related to greater anxious arousal and worry in the presence of an unwillingness to accept and experience emotional distress. Using a similar but more comprehensive regulatory strategy, anxiety sensitivity was shown to be related to greater anxious arousal, worry, and agoraphobic cognitions when people also believed they could not do little to effectively cope with unwanted and distressing emotional states. Additionally, anxiety sensitivity was related to greater agoraphobic cognitions in the presence of greater emotional expressiveness. Strikingly, in the absence of these self-regulatory processes, people with high anxiety sensitivity did not show any elevations in anxiety-related symptoms. Thus, people with high anxiety sensitivity do not appear to be a homogenous group, as associated risks appear to be at least partially dependent on the habitual use of particular affect regulatory strategies. That being said, the main effects of anxiety sensitivity and non-acceptance of emotional distress were robust predictors of greater anxiety-related symptoms. The magnitude of our Anxiety Sensitivity × Regulatory Strategy interactions were small ($R^2\Delta$ ranged from .01 to .03). However, these interaction effects are in the typical range for psychological studies (e.g., 1–3% of variance explained; Aiken & West, 1991). More importantly, an examination of simple effects show that the magnitude of incremental variance do not adequately account for how these moderational relations elucidate the heterogeneous outcomes of people high in anxiety sensitivity.

The related constructs of being unwilling to accept emotional distress and believing that these states cannot be effectively tolerated or regulated appear to be particularly important in understanding vulnerability processes for anxiety symptoms. The present data suggest that anxiety sensitivity may be especially relevant to greater levels of anxiety symptoms among individuals with reflexive, non-accepting approaches to internal feelings, thoughts, and physiological arousal. Although these interactive models were specific to predicting anxiety-related symptoms and not depressive-related symptoms, anxiety sensitivity, the non-acceptance of emotional distress, and limited access to regulatory strategies were each positively related to anhedonia. Thus, explanatory specificity was apparent for the interactive, but not main effect level of analysis of the studied variables. Further work is needed on if, and how, these constructs operate in the development and/or maintenance of depressive conditions and other clinical conditions (e.g., sexual dysfunctions).

The related constructs of non-acceptance of emotional distress and limited access to effective regulatory strategies were shown to be more important predictors of anxiety and depressive symptoms than emotional expressiveness. These acceptance-based constructs are defined by reflexive negative evaluations of normative negative emotional reactions, beliefs that it is unhelpful to be in direct contact with these undesirable emotions, and deliberate attempts to control or monitor these states due to concerns about their harmful consequences. These affect regulatory strategies may theoretically serve to enhance the negative effects of anxiety sensitivity in a variety of ways. Past research suggests self-regulation consumes limited resources such as what can be attended to at any given moment and physical and mental stamina during situational tasks and challenges (Muraven & Baumeister, 2000). Prolonged, inflexible non-acceptance of emotional responses can consume attention, vitality and other resources, leaving fewer resources to cope and thrive in everyday life. The over-exertion and depletion of these resources are expected to be particularly pronounced for people with emotion vulnerabilities such as anxiety sensitivity. Specifically, for individuals who fear the negative consequences of anxiety states, it may be particularly problematic to believe that nothing can be done with unpleasant and bothersome emotional experiences (limited access to strategies DERS subscale). Although the present research design cannot explicate the nature of this explanation or how these processes unfold over time, the results provide preliminary, albeit needed, evidence for interactive

mechanisms. Future use of prospective paradigms could usefully build from the present study.

There was some mixed support that the benefits of intentionally expressing emotions to cope with stress are compromised in the presence of high anxiety sensitivity. For less anxiety sensitive people, greater emotional expression was related to less agoraphobic cognitions but for more anxiety sensitive people this mode of expression was associated with more anxiety symptoms. However, this model was not evident for anxious arousal or worry. Also, emotional expression was not directly related to these symptoms (''main effects''). This lack of supportive evidence may be related to the ''complex nature'' of emotional expression. In general, expressing emotions openly, as opposed to trying to conceal and hide them, is adaptive. Being more expressive of emotions allows for greater authenticity or congruence between self-perceptions and internal experiences with behavior (John & Gross, 2004; Rogers, 1951). However, uninhibited emotional expression may be problematic when people are burdened by frequent and intense negative feelings, thoughts, images, and sensations (Joiner, 2000). For example, for relationship partners, it may be burdensome to encounter and support this chronic level of emotional distress and can eventually elicit rejection and the erosion of social support (see Kashdan et al., in press for supportive data; Kennedy-Moore & Watson, 2001). Despite inconsistent findings, there was stronger support for a model in which high but not less emotional expression was associated with the most anxiety symptoms in the context of high anxiety sensitivity. Given such data, it may be that tests of more specific types of emotional expression are needed; that is, predictions derived from an explicit understanding of the social context in which emotional expression is completed. Additionally, whether or not people are high in anxiety sensitivity, psychological health may be best defined by the flexible ability to express, suppress, or amplify the visibility of emotions as desired or required by situational demands. There is merit in using research designs that can adequately test these more complex models.

Outside of the above noted issues, the current study has a number of other interpretative caveats that warrant consideration. First, the present investigation relied on self-report instruments and all of the limitations of this strategy are relevant. As an example, one of our primary moderator variables was emotion expression and higher self-reported emotion expression may be confounded with people's attendance to and willingness to disclose anxious arousal (our primary outcome). Future work should incorporate multimethod approaches to indexing the variables of interest. Second, due to the cross-sectional nature of the present research design, it is not possible to make causal statements. An important next step is the use of prospective methodologies or to experimentally manipulate certain regulatory strategies in the laboratory and test singular and interactive effects to theoretically relevant stressors (e.g., bodily sensations). Third, the current findings were based on a relatively homogenous community sample. It will be important to examine the current models in select clinical samples and ethnically diverse individuals. Fourth, our outcome measures were limited to ''pure'' self-report indices of anxious arousal, worry, and agoraphobic cognitions. Thus, generalizations about our findings should be conducted cautiously. There is merit in examining the current findings with more broad-band measures of anxious responding and how everyday roles and activities are affected. In addition, extensions of the current study can be derived by sampling people who differ in anxiety sensitivity and examining the degree to which regulatory strategies operate successfully in different situations. Translational and clinical studies need to operationalize situations and account for variance attributable to person–situation interactions. For example, the degree to which it is important for a person to be competent in a situation should affect the utility of any particular regulatory strategy. The interplay between emotion vulnerabilities and affect regulatory strategies on distress and impairment is expected to be more complex than our current model (Zvolensky, Schmidt et al., 2006). However, our current findings are a necessary first step in moving beyond linear ''main effect'' models that often omit important sources of variance which can lead to misinterpretations of risk and resilience.

Overall, our data suggest that dispositional anxiety sensitivity may be particularly problematic in the presence of certain affect regulatory strategies. The primary questions behind this line of research continue to be how and why people differ in their generation of distress, which people are most susceptible to pain and suffering, and which processes are the most important to target for successful intervention. Emotion and affect regulation offer promise in expanding the way in which anxiety-related pathology is understood, how it develops, and how to treat it.

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