
**RELATIONSHIPS BETWEEN THE MULTIPLE
DIMENSIONS OF ANXIETY SENSITIVITY AND
SYMPTOMS OF ANXIETY AND DEPRESSION IN
MEN AND WOMEN**

Valerie A. NOËL^{}, Karen LEWIS, Sarah E. FRANCIS, Peter G. MEZO*

Memorial University of Newfoundland, St. John's, Newfoundland, Canada

Abstract

Anxiety sensitivity (AS) is most often described in its multidimensional and hierarchical form, consisting of three lower order factors: fear of physical symptoms, fear of publically observable symptoms, and fear of cognitive dyscontrol. The lower order factors of AS have been shown to be differentially predictive of panic disorder, social anxiety, generalized anxiety disorder, and depression. However, there is limited research exploring sex differences in these relationships. The present study examined three specific anxiety symptom clusters (i.e., physiological hyperarousal, worry, and social anxiety symptoms) and depressive symptoms and their relationship with measures of the three lower order factors of AS (i.e., physical concerns, social concerns, and mental incapacitation) in men and women. Sex differences were observed in the unique associations between the lower order factors and physiological hyperarousal and social anxiety symptoms; similar relationships between men and women, which were also consistent with the hierarchical structure of AS, were observed with worry and depressive symptoms.

Keywords: anxiety sensitivity, sex differences, anxiety, depression, men, women

The construct of anxiety sensitivity (AS) originated from Reiss and McNally's (1985) elaboration of Goldstein and Chambless' (1978) concept of the fear of fear (Reiss, 1991; Reiss & McNally, 1985). Specifically, Reiss and McNally (1985) proposed that the fear of fear can be separated into two component processes called anxiety expectancy (learning the associations between specific stimuli and the experience of anxious symptoms or fear) and anxiety sensitivity. Anxiety sensitivity is the belief that anxiety related symptoms

* Correspondence concerning this article should be addressed to:
E-mail: valerie.noel@mun.ca

(increased heart rate, sweating, dizziness) have harmful, if not catastrophic physical, psychological, or social consequences (Reiss & McNally, 1985). Anxiety sensitivity was originally proposed as a specific vulnerability trait for panic disorder: anxiety sensitivity has been shown to be highly correlated with panic disorder symptoms, precedes the development of panic disorder symptoms, and has been demonstrated to be a predictor of spontaneous panic attacks (Maller & Reiss, 1992; Plehn & Peterson, 2002; Schmidt, Lerew, & Jackson, 1999). However, other research has shown that elevated levels of AS are also associated with depression, generalized anxiety disorder, and social anxiety disorder, and that AS is predictive of the onset of these disorders (e.g., Amir, Coles, & Foa, 2002; Calamari, Rector, Woodard, Cohen, & Chik, 2008; Hazen, Walker, & Stein, 1994; Maller & Reiss, 1992; Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004; Viana & Rabian, 2009; Wald & Taylor, 2007).

AS has been suggested to be multidimensional, consisting of separate and distinct factors that appear to be hierarchical in nature (Lewis, et al., 2010; Lilienfeld, 1996; Lilienfeld, Turner, & Jacob, 1993; Olatunji & Wolitzky-Taylor, 2009). Olatunji and Wolitzky-Taylor (2009) provided an illustration of the structure of AS drawing from research examining AS in its multidimensional and hierarchical form (see Figure 1) [insert figure 1 here]. The higher order factors of AS are negative affect followed by trait anxiety. The lower order factors, which exhibit the multidimensional nature of AS, are fear of physical symptoms, fear of publically observable symptoms, and fear of cognitive dyscontrol. The lower order factors are said to have differential associations with panic disorder, social anxiety disorder, generalized anxiety disorder, and depression. Although this model draws from research examining AS in its multidimensional and hierarchical form, limited research has examined the potential differential relationships between the lower order factors of AS and symptoms of anxiety and depression as depicted in Figure 1 among women and men separately (Olatunji & Wolitzky-Taylor, 2009). The purpose of the present study is to investigate these less well understood relationships between AS and anxiety and depression in separate samples of women and men.

Anxiety sensitivity is most commonly measured by the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986). Reiss et al. (1986) conducted a factor analysis of the ASI which revealed 13 of the 16 items loaded on a single factor, suggesting that AS, as measured by the ASI, was a unitary construct. Following the original article, a four-factor solution was reported by several other studies (e.g. Cox, Parker, & Swinson, 1996; Peterson & Heilbronner, 1987). However, more recent literature provides support for a three factor solution, which was first introduced by Zinbarg, Barlow, and Brown (1997). Zinbarg et al. (1997) identified the three factors as *AS-Physical Concerns*, *AS-Social Concerns*, and *AS-Mental Incapacitation*. Further evidence for the three factors has been demonstrated by additional research (e.g. Deacon & Valentiner, 2001; Mohlman & Zinbarg, 2000; Rodriguez, Bruce, Pagano, Spencer, & Keller,

2004). These three factors measure the] lower order factors of AS: fear of physical sensations (physical concerns), fear of publically observable symptoms (social concerns), and fear of cognitive dyscontrol (mental incapacitation) (Olatunji & Wolitzky-Taylor, 2009; Taylor, 1999).

Recent consensus that the underlying structure of AS is hierarchical in nature, with all of the factors of AS loading on to a single higher order factor (Blais, Otto, & Zucker, 2001; Hayward, Killen, Kraemer, & Taylor, 2000; Zinbarg, Brown, Barlow, & Rapee, 2001) has led to the exploration of the relationship between AS and the specific anxiety disorders. It has been proposed that the three factors of AS (fear of physical sensations, fear of publically observable symptoms, and fear of cognitive dyscontrol) relate both differentially and uniquely to specific anxiety disorders (i.e., panic disorder, social phobia, generalized anxiety disorder) and depression (Abramowitz, 2006; McKay et al., 2004; Rector, Szacun-Shimizu, & Leybman, 2007). The AS model illustrated by Olatunji & Wolitzky-Taylor (2009) was developed based on early literature examining the relationship between specific dimensions of AS and anxiety disorders and depression. In the AS model it is outlined that fear of physical concerns is predictive of panic disorder, fear of publically observable symptoms is predictive of social anxiety disorder, and fear of cognitive dyscontrol is predictive of generalized anxiety disorder and depression.

Research examining specifically whether these relationships are maintained across sex is limited and furthermore inconsistent. A substantial proportion of the literature examining AS and sex differences compare global levels of AS between men and women rather than the specificity among the lower order AS factors and anxiety and depression. Several studies in both clinical samples (Cox, Swinson, Shulman, Kuch, & Reichman, 1993; Foot & Koszycki, 2004; Goodin et al., 2009) and non-clinical samples (Feldner, Zvolensky, Schmidt, & Smith, 2008; Goodin et al., 2009; Katz, Martin, Pagé, & Calleri, 2009) have noted no sex differences in AS as a unidimensional construct. Yet other studies have found women to demonstrate higher levels of AS than men (O'Connor, Farrow, & Colder, 2008; Schmidt & Koselka, 2000; Telch, Lucas, & Nelson, 1989; Zvolensky, McNeil, Porter, & Stewart, 2001).

Van Dam, Earleywine, and Forsyth (2009), who initially reported women to have higher AS than men, examined the item construction of the ASI. It was revealed that removal of 2 items (items 2 and 4), which did not compromise the reliability of the instrument ($\alpha = .88$; initial $\alpha = .89$), resulted in no sex differences in AS. It can be suggested that reported differences in AS may be due to the items used to measure AS being slightly more descriptive of women's symptom expression of AS. As such, one may question the validity of the findings of sex differences in AS. Additional research is warranted. An unclear pattern also emerges in sex differences when AS is studied in its multidimensional form.

Stewart, Taylor, and Baker (1997) reported women to have higher levels of AS physical concerns; comparable levels were observed between men and

women in AS psychological concerns and AS social concerns. Foot and Koszycki (2004), Keogh (2004), and Zvolensky, et al. (2001) also reported women to have higher AS physical concerns scores. However, additional findings were observed by Foot and Koszycki (2004) and Keogh (2004). Foot and Koszycki (2004) observed a trend whereby men appeared to have higher AS social concerns than women. Keogh (2004) noted that women had higher AS mental concerns than men; however, the magnitude of the effect was also small. Contrary to the preceding findings, McLeish, Zvolensky, and Luberto (2011) reported no correlation between sex and AS physical, psychological, and social concerns. It is evident from the limited and inconsistent findings observed across these that sex differences in the multidimensional construct of AS are poorly understood.

Two studies have examined sex differences in the factor structure of AS. Keogh (2004) observed that a two factor solution best described the data. Following these analyses he tested sex differences of model fit for a two factor 10-item ASI. Keogh (2004) did not observe sex differences (after removing one mental concerns item). However, it appears that only one study has examined sex differences in the model illustrated by Olatunji and Wolitzky-Taylor (2009). Similar to Keogh (2004), Stewart, et al. (1997) reported the lower order factor structure of the ASI was identical in men and women. However neither study examined whether the differential relationships between the lower order factors and the anxiety disorders and depression differ between men and women. Olatunji and Wolitzky-Taylor (2009) suggested that AS may be a stronger risk factor for anxiety disorders in women compared to men. However, they also suggested that AS may better differentiate anxiety from depression in men compared to women. Furthermore, the factor structure of AS has been compared between boys and girls and men and women (Bernstein, Zvolensky, Stewart, Comeau, & Leen-Feldner, 2006; Keogh, 2004; Stewart et al., 1997; Wright et al., 2010). As such, research is needed to test sex differences at this level

Present Study

The aim of the present study is to examine the hierarchical and multi-dimensional model of AS illustrated by Olatunji and Wolitzky-Taylor (2009) among men and women. Given the equivocal findings that have been reported to date with respect to potential sex differences in levels of specific facets of AS (e.g., Foot & Koszycki, 2004; McLeish et al., 2011; Stewart et al., 1997; Zvolensky et al., 2001), this study took as a first step the task of examining the pattern of relationships that exist between anxiety and depression and specific AS factors in two separate groups of women and men participants. As such, the intent of this study was not simply to directly compare women and men with respect to specific AS factors, but rather to examine, within each sex group separately, how individual AS factors are related to symptoms of anxiety and depression. Accordingly, this study tested the lower-order factors of AS as predictors of a

symptom constellation associated with each disorder outlined in the model in the two separate groups. For example, depression was operationalized as the level of depressive symptoms measured using an adult self-report measure. It is predicted that (1) physical concerns will predict physiological hyperarousal; (2) social concerns will predict social anxiety symptoms; (3) mental concerns will predict both worry and depressive symptoms. A description of these relationships within each sex will provide a basis from which future research may pose and test questions related to specific sex differences in the relationships of anxiety and depression to AS. It is predicted that the associations outlined in the hierarchical depiction of AS, posited by Olatunji and Wolitsky-Taylor, (see Figure 1) will be observed using the corresponding ASI scales predicting each disorder's respective symptom constellation. Specifically, physical concerns (fear of physical sensations) will predict physiological hyperarousal (panic disorder), social concerns (fear of publically observable symptoms) will predict social anxiety symptoms (social anxiety), and mental incapacitation (fear of cognitive dyscontrol) will predict both worry (generalized anxiety disorder) and depressive symptoms (depression). It is anticipated that similar patterns in the relationships of each lower order AS factor with the anxious and depressive symptoms will be observed in each sex group; however, a definitive hypothesis cannot be made as sex-specific AS-symptom relationships have not previously been examined in this model.

Method

Participants

The current study consisted of 410 undergraduate students (301 women and 109 men) ranging in age from 18-45 years ($M = 20.12$, $SD = 3.68$). The majority of participants were white (88.5%).

Measures

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990). The PSWQ is a 16-item measure of chronic worry. In the present study the PSWQ was used as a measure of generalized anxiety symptoms. Participants are required to rate each item on a 1- to 5-point Likert scale that ranges from 'not at all typical of me' to 'very typical of me'. As an individual's score on the PSWQ increases, it indicates increasing levels of worry. Studies support the good reliability and validity of the PSWQ with a reported high level of internal consistency (ranging from .80 to .95).

The Depression Anxiety Stress Scales 21-item version (DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998). The DASS-21 assesses the core symptoms of depression, anxiety, and tension/stress, and consists of 21 self-report items that are grouped into three 7-item subscales (i.e., Depression, Anxiety, and Stress). The depression scale was used to measure depressive symptoms in the present study; the anxiety scale was used to measure physiological hyperarousal after

controlling for depressive symptoms. Participants are asked to report the frequency and severity of any negative emotions they have experienced over the previous week on a 4-point Likert scale, ranging from 0 ('did not apply to me at all') to 3 ('applied to me very much, or most of the time'). Scores range between 0 and 21 on each subscale and higher ratings indicate higher levels of depression, anxiety, and stress. The DASS-21 is widely used and shows good overall validity as well as high internal consistency and reliability. In particular, the Depression scale correlates strongly with the Beck Depression Inventory (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) and the Anxiety subscale correlates strongly with the Beck Anxiety Inventory (Beck & Steer, 1990; Lovibond & Lovibond, 1995).

The Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky & McNally, 1986). The ASI is a 16-item self-report scale that measures AS in terms of the beliefs about possible negative consequences of symptoms associated with anxiety. The ASI is made up of three subscales: AS Physical Concerns (fear of sensations); AS Cognitive Concerns (fear of negative psychological consequences of anxiety-related cognitive experiences); and, AS Social Concerns (fear of possible negative social ramifications of publicly observable anxiety sensations) (Reiss et al., 1986). These three subscales were used to measure the three lower-order dimensions of AS: fear of publically observable symptoms, fear of cognitive dyscontrol, and fear of publically observable symptoms, respectively. Participants are asked to rate the degree to which they agree with listed thoughts and feelings on a 5-point Likert scale from 0 ('very little') to 4 ('very much'). The ASI has good internal consistency (range = .82 to .91) and acceptable test-retest reliability of .75 over 2 weeks (Reiss et al., 1986) and .71 over 3 years (Maller & Reiss, 1992). Reiss et al. (1986) reported moderate two-week test-retest reliability estimates among men ($r = .70$) and women ($r = .74$).

The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). The SIAS is a 19-item measure that is used to assess levels of anxiety experienced before and during situations of social interaction. Fear of social interaction is described as distress when meeting and talking with other people. Social interaction is one of at least two types of social anxiety disorder (the second being social phobia; Kashdan, 2002; Hughes et al., 2006). The SIAS has demonstrated greater specificity to symptoms of social phobia compared to the Social Phobia Scale (SPS; Mattick & Clarke, 1998), which was designed to be used in conjunction with the SIAS (Osman, Gutierrez, Barrios, Kopper, & Chiros, 1998); and so, in the present study, the SIAS was used as a measure of social anxiety symptoms. Participants are asked to rate each item (e.g., 'I am tense mixing in a group') on a 5-point Likert scale from 0 ('not at all') to 5 ('extremely') (Mattick & Clarke, 1998). The SIAS has been found to have high internal consistency ($\alpha = .93$) and a high 1-month test-retest reliability, $r > .90$ (Hofmann, 2007).

Procedure

The current study received ethics approval from the university's ethics board. To recruit participants, research assistants visited introductory psychology classes and verbally informed the students of the opportunity to be involved in the research study. Incentives for participation included either (a) a draw for gift certificates for a local mall, or (b) a two percent bonus mark towards their final grade. Participants were given two options to complete the questionnaire battery: online through a secured website or by paper copies. The order for the questionnaires administered was randomized.

Results

Internal consistencies of the DASS-21 anxiety scale, the DASS-21 depression scale, the PSWQ, the SIAS, and the ASI and its subscales (physical concerns, social concerns, and fear of cognitive dyscontrol) for each sex are reported in Table 1. Internal consistencies of all measures were moderate ranging from $\alpha = .71$ to $.86$ in men and $.78$ to $.88$ in women with the exception of the ASI-social concerns subscale. Low reliabilities ($\alpha < .70$) for the social concerns subscale, which have been reported by previous studies (e.g., Spice, Jones, Hadjistavropoulos, Kowalyk, & Stewart, 2009; Zinbarg & Barlow, 1996; Zvolensky, et al., 2007), were found in men ($\alpha = .48$) and women ($\alpha = .47$). There were no significant differences between students who completed the paper-based questionnaires and students who completed their questionnaires online on any of the questionnaires or subscales.

Correlation analyses in men and women between the DASS-21 anxiety scale, the DASS-21 depression scale, the PSWQ, the SIAS, and the ASI and its subscales (physical concerns, social concerns, and fear of cognitive dyscontrol) revealed significant correlations with the majority being moderate to high in effect size (Cohen & Cohen, 1983) (see Table 1). Among men, the correlation between DASS-21 depression scale and the ASI physical sensations subscale was not significant ($r = .19$); however, among women, all correlations were significant including the correlations between the ASI social concerns sub scale and the DASS-21 depression scale ($r = .17$) and the PSWQ ($r = .15$), despite being small in terms of effect size.

Analysis of variance (ANOVA) was used to examine whether men and women differed in anxious and depressive symptoms (see Table 2). It was found that women had significantly higher scores on the ASI, the ASI-physical concerns, the SIAS, and the PSWQ, and thus reported more social anxiety, worry, AS related to physical symptoms, and AS overall than men. However, the difference between men's and women's scores on the ASI full scale and the SIAS were small in effect size. There were no significant differences between men and women on the other scales.

Articles Section

Table 1. Correlations and reliability estimates of the Depression Anxiety Stress Scales-21 (DASS-21), the Penn State Worry Questionnaire (PSWQ), the Social Interaction Anxiety Scale (SIAS), and the Anxiety Sensitivity Index (ASI) (N=410).

Measure	1.	2.	3.	4.	5.	6.	7.	8.
1. DASS-21-A	-	.66**	.34**	.20**	.35**	.33**	.18**	.32**
2. DASS-21-D	.46**	-	.38**	.30**	.30**	.27**	.17**	.29**
3. PSWQ	.54**	.47**	-	.18**	.27**	.24**	.15**	.27**
4. SIAS	.31**	.38**	.36**	-	.38**	.33**	.28**	.36**
5. ASI (Total)	.42**	.27**	.46**	.51**	-	.93**	.70**	.82**
6. ASI (Physical)	.29**	.19	.37**	.46**	.92**	-	.49**	.63**
7. ASI (Social)	.30**	.24*	.36**	.38**	.76**	.56**	-	.48**
8. ASI (Mental)	.51**	.30**	.36**	.43**	.79**	.57**	.48**	-
Coefficient α (men)	.71	.87	.72	.86	.87	.83	.48	.77
Coefficient α (women)	.78	.88	.78	.85	.88	.85	.47	.80

Note. Women represent the portion above the diagonal, men represent the portion below the diagonal; DASS-21-A = Depression Anxiety and Stress Scales – Anxiety Subscale; DASS-21-D = Depression Anxiety and Stress Scales – Depression Subscale (Antony et al., 1998). PSWQ: Penn State Worry Questionnaire (Meyer et al., 1990). SIAS: Social Interaction Anxiety Scale (Mattick et al., 1998). ASI: Anxiety Sensitivity Index; ASI (Social) = Anxiety Sensitivity Index – Social Concerns Subscale; ASI (Mental) = Anxiety Sensitivity Index – Mental Concerns Subscale; ASI (Physical) = Anxiety Sensitivity Index – Physical Concerns Subscale (Reiss et al., 1986).

*p < .05. **p < .01

Table 2. Analysis of variance testing sex differences on the Depression Anxiety Stress Scales-21 (DASS-21 anxiety scale and DASS-21 depression scale) the Penn State Worry Questionnaire (PSWQ), the Social Interaction Anxiety Scale (SIAS), the Anxiety Sensitivity Index (ASI)-Fear of physical symptoms, the Anxiety Sensitivity Index (ASI)-Social concerns and the Anxiety Sensitivity Index (ASI)- Fear of cognitive dyscontrol.

	Male Mean (SD)	Female mean (SD)	F-value	p-value	η^2
ASI	18.18 (10.21)	22.89 (11.04)	15.15**	<.01	.04
ASI Social	7.08 (2.90)	7.68 (2.86)	3.44	.06	.01
ASI Physical	8.08 (5.86)	11.63 (6.70)	23.88**	<.01	.06
ASI Mental	3.01 (3.32)	3.59 (3.42)	2.25	.13	.01
SIAS	23.90 (14.18)	27.78 (14.31)	5.90*	.02	.01
DASS-21 A	4.04 (3.44)	4.62 (4.13)	1.73	.19	<.01
DASS-21 -D	4.71 (4.43)	4.68 (4.42)	<.01	.95	<.01
PSWQ	42.87 (15.54)	55.54 (15.09)	55.50**	<.01	.12

Note. DASS-21-A = Depression Anxiety and Stress Scales – Anxiety Subscale; DASS-21-D = Depression Anxiety and Stress Scales – Depression Subscale (Antony et al., 1998). PSWQ: Penn State Worry Questionnaire (Meyer et al., 1990). SIAS: Social Interaction Anxiety Scale (Mattick et al., 1998). ASI: Anxiety Sensitivity Index; ASI (Social) = Anxiety Sensitivity Index – Social Concerns Subscale; ASI (Mental) = Anxiety Sensitivity Index – Mental Concerns Subscale; ASI (Physical) = Anxiety Sensitivity Index – Physical Concerns Subscale (Reiss et al., 1986).

*p < .05. **p < .01

Table 3. Summary of Regression Analyses for the female sample- Anxiety Sensitivity Index (ASI)-fear of physical symptoms, the Anxiety Sensitivity Index (ASI)-fear of publically observable symptoms, and the Anxiety Sensitivity Index (ASI)- fear of cognitive dyscontrol predicting symptoms associated with the anxiety disorders and depression.

	B	SE	β	<i>t</i>	R^2 Change
<i>Depressive Symptoms</i>					$R^2 = .10,$
<i>(Dass-21-D)</i>					$F(3, 297) = 10.60^*$
ASI_Physical	.09	.05	.14	1.84	
ASI_Social	<.01	.10	<.01	.04	
ASI_Mental	.27	.10	.21	2.78**	
<i>Worry (PSWQ)</i>					$R^2 = .08,$
					$F(3, 297) = 8.63^{**}$
ASI_Physical	.29	.17	.13	1.72	
ASI_Social	-.01	.35	<-.01	-.02	
ASI_Mental	.82	.33	.19	2.50*	
<i>Social Anxiety (SIAS)</i>					$R^2 = .15,$
					$F(3, 297) = 18.08^{**}$
ASI_Physical	.30	.15	.14	1.95	
ASI_Social	.55	.32	.11	1.74	
ASI_Mental	.91	.30	.22	3.04**	
<i>Physiological Hyperarousal</i>					
<i>(Dass-21-A)</i>					
Step 1					$R^2 = .43,$
					$F(1, 299) = 225.42^{**}$
Dass-21-D	.61	.04	.66	15.01**	
Step 2					$R^2 \Delta = .03,$
					$F(3, 296) = 5.33^{**}$
ASI_Physical	.09	.04	.15	2.54*	
ASI_Social	-.04	.07	-.03	-.53	
ASI_Mental	.07	.07	.06	1.07	

Note. DASS-21-A = Depression Anxiety and Stress Scales – Anxiety Subscale; DASS-21-D = Depression Anxiety and Stress Scales – Depression Subscale; PSWQ: Penn State Worry Questionnaire; SIAS: Social Interaction Anxiety Scale; ASI (Social) = Anxiety Sensitivity Index – Social Concerns Subscale; ASI (Mental) = Anxiety Sensitivity Index – Mental Concerns Subscale; ASI (Physical) = Anxiety Sensitivity Index – Physical Concerns

* $p < .05$. ** $p < .01$

Regression analyses were used to determine which ASI subscales (physical concerns, social concerns, or mental incapacitation) were specifically predictive of physiological hyperarousal, social anxiety symptoms, worry, and depressive symptoms in men and women. The regression analyses were tested

separately for men and women based on the statistical approach used in earlier exploratory research in the factor structure of AS across sex and other dichotomous groups (e.g., Keogh, 2004; Schmidt & Joiner, 2002). To test the predictive relationship between the subscales of the ASI, representing the lower order factors of AS, and the symptoms of the specific disorders (i.e., panic disorder-physiological hyperarousal, social anxiety-social anxiety symptoms, generalized anxiety disorder-worry, and depression-depressive symptoms), each symptom constellation corresponding to the four disorders (panic, social anxiety, generalized anxiety, and depression) was regressed on the subscales of the ASI. Specifically, depressive symptoms, worry, and social anxiety symptoms were together regressed on the physical concerns subscale, the social concerns subscale, and the mental concerns subscale. To predict physiological hyperarousal, depression was controlled for before physical concerns, social concerns, and mental concerns were entered to predict anxiety. Controlling for depression when predicting anxiety, was intended to remove all shared variance between anxiety and depression, leaving physiological hyperarousal, which is in line with the tripartite model of anxiety and depression (Clark & Watson, 1991).

Among women, mental concerns predicted depressive symptoms, worry, and social anxiety symptoms; physical concerns predicted physiological hyperarousal; social concerns did not predict any of the four disorder symptom constellations (see Table 3 for regression coefficients). In other words, depressive symptoms were predicted by mental incapacitation; worry was predicted by mental incapacitation; social anxiety symptoms was predicted by mental incapacitation; and physiological hyperarousal was predicted by physical concerns.

The observed relationships between the symptoms and the subscales of the ASI are illustrated in Figure 2. Among women, all relationships observed in this sample were predicted by the multidimensional hierarchical structure of AS (see Figure 1), with the exception of social anxiety symptoms which were not predicted by social concerns but instead by mental incapacitation.

The observed relationships in men differed from those found in women (see Figure 3). Among men, physical concerns and mental incapacitation predicted social anxiety symptoms and mental incapacitation predicted physiological hyperarousal (see Table 4 for regression coefficients), which differs from predictions illustrated in the hierarchical model of AS. In other words, among men, social anxiety symptoms were predicted by both physical concerns and mental incapacitation, whereas among women social anxiety symptoms was only predicted by mental incapacitation. Among men, physiological hyperarousal was predicted by mental incapacitation, whereas among women, physiological hyperarousal was predicted by physical concerns. [insert Figure 3 here]The pattern in the relationships between worry and the ASI subscales and depressive symptoms and the ASI subscales did not differ between men and women. That is, both depressive symptoms and worry were predicted by mental incapacitation

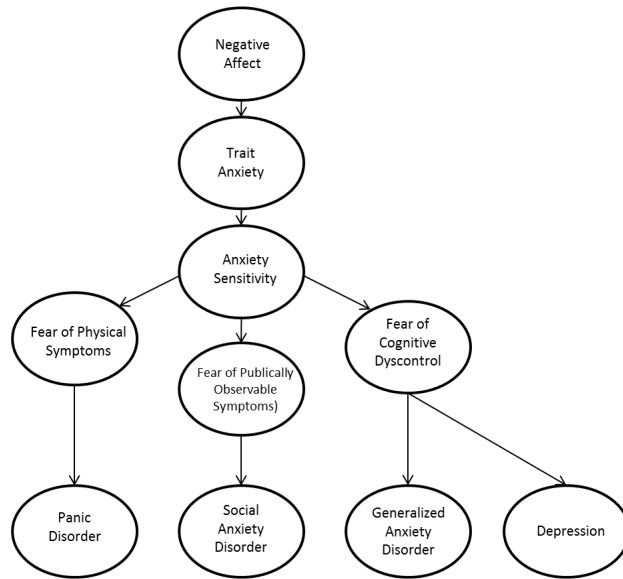


Figure 1. Olatunji and Wolitz-Taylor (2009) conceptualization of a multidimensional and hierarchical model of the unique relationship between anxiety sensitivity and anxious and depressive symptoms

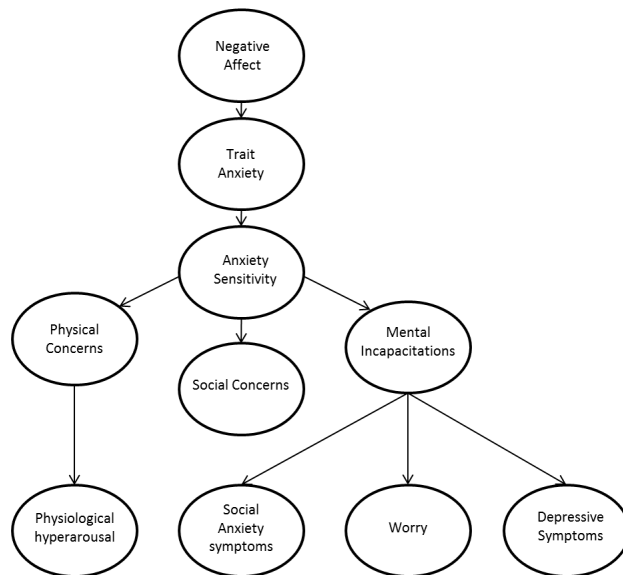


Figure 2. A multidimensional and hierarchical model of the unique relationship between anxiety sensitivity and anxious and depressive symptoms in women

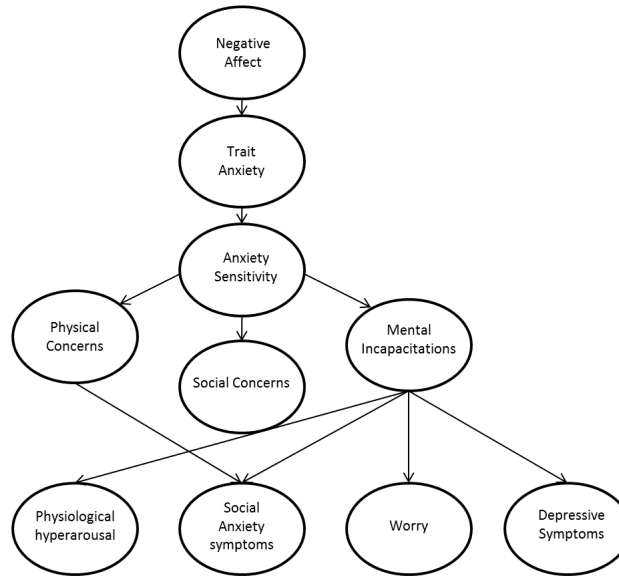


Figure 3. A multidimensional and hierarchical model of the unique relationship between anxiety sensitivity and anxious and depressive symptoms in men

(see Table 4 for regression coefficients among men), which is consistent with the predictions outlined in the hierarchical structure of AS.

From the analyses it can be observed that not all relationships illustrated in the multidimensional and hierarchical definition of AS (see Figure 1) were found among men (see Figure 3). Particularly, it was hypothesized that panic disorder would be predicted by fear of physical symptoms; however, among men it was observed that physiological hyperarousal was predicted by mental incapacitation (see Table 4). Additionally, social anxiety disorder was hypothesized to be predicted by fear of publically observable symptoms; yet among men, social anxiety symptoms was predicted by physical concerns and mental incapacitation. Examining all analyses, it is clear that the multidimensional and hierarchical structure of AS differs between the sexes.

Discussion and conclusions

The purpose of the present study was to examine whether the lower order factors of AS (i.e., fear of physical sensations, fear of publically observable symptoms, and fear of cognitive dyscontrol), measured using the subscales of the ASI (physical concerns, social concerns, and mental incapacitation, respectively), concurrently predicted and differentiated the symptom constellations of panic

Table 4. Summary of Regression Analysis for the male sample - Anxiety Sensitivity Index (ASI)-fear of physical symptoms, Anxiety Sensitivity Index (ASI)-fear of publically observable symptoms, and Anxiety Sensitivity Index (ASI)- fear of cognitive dyscontrol predicting symptoms associated with the anxiety disorders and depression.

	B	SE	β	<i>t</i>	R^2
<i>Depressive Symptoms</i> (<i>Dass-21-D</i>)					$R^2=.10,$ $F(3,105) = 3.90^*$
ASI_Physical	-.03	.09	-.03	-.27	
ASI_Social	.21	.18	.14	1.20	
ASI_Mental	.33	.15	.25	2.15*	
<i>Worry (PSWQ)</i>					$R^2=.23,$ $F(3,105) = 10.20^{**}$
ASI_Physical	.32	.30	.12	1.06	
ASI_Social	.77	.57	.14	1.35	
ASI_Mental	1.40	.50	.30	2.79**	
<i>Social Anxiety (SIAS)</i>					$R^2=.26,$ $F(3,105) = 12.56^{**}$
ASI_Physical	.62	.27	.26	2.32*	
ASI_Social	.61	.51	.13	1.20	
ASI_Mental	.98	.45	.23	2.13*	
<i>Physiological Hyperarousal</i> (<i>Dass-21-A</i>)					
Step 1					$R^2=.21,$ $F(1,107) = 28.52^{**}$
Dass-21-D	.36	.07	.46	5.34**	
Step 2					$R^2=.16,$ $F(3,104) = 8.51^{**}$
ASI_Physical	-.02	.06	-.03	-.30	
ASI_Social	.05	.12	.04	.45	
ASI_Mental	.42	.10	.41	4.11**	

Note.DASS-21-A = Depression Anxiety and Stress Scales – Anxiety Subscale; DASS-21-D = Depression Anxiety and Stress Scales – Depression Subscale; PSWQ: Penn State Worry Questionnaire; SIAS: Social Interaction Anxiety Scale; ASI (Social) = Anxiety Sensitivity Index – Social Concerns Subscale; ASI (Mental) = Anxiety Sensitivity Index – Mental Concerns Subscale; ASI (Physical) = Anxiety Sensitivity Index – Physical Concerns

* $p < .05$. ** $p < .01$

disorder, social anxiety disorder, generalized anxiety disorder, and depression, across sex and whether the observed findings support the multidimensional and hierarchical description of AS (see Figure 1). In the present study, the pattern of relationships between the lower order factors of AS and the symptom constellations associated with the three specific anxiety disorders and depression

differed for women and men. As well, the findings among men and women only partially support the description of AS illustrated in Figure 1.

Patterns of particular interest were the ASI subscales' differential relationship with physiological hyperarousal for each of the sexes. In women, physical concerns predicted physiological hyperarousal, which is consistent with the multidimensional and hierarchical description of AS demonstrating the lower order factor's ability to differentiate between symptoms of the anxiety disorders and depression. In men, however, physical concerns did not predict physiological hyperarousal, as it did in women and as it is described in the AS model; rather mental incapacitation was a significant predictor of physiological hyperarousal. Alternatively, physical concerns predicted social anxiety symptoms in men. These were the most substantive discrepancies observed between men and women in these relationships.

An additional unexpected finding which was observed in both men and women was that social concerns was not a significant predictor of social anxiety symptoms as it is described in the model of AS. Moreover, social concerns did not predict any of the symptoms of anxiety or depression. Several reasons may explain this finding. Firstly, the internal consistency of this subscale was considerably low. Based on Nunnally's (1978) requirement of reliability of an instrument to be no lower than .3, the social concerns subscale did meet the cut-off; however, the low reliability is questionable as it has also been observed in previous studies. If the anxious and depressive symptoms were differentially related to some of the items in the ASI social concerns subscale, the poor performance of the ASI social items might have masked any observable differential relationships between social concerns and the symptoms of anxiety and depression.

Secondly, it could be proposed that the social concerns subscale may not be measuring fear of publically observable symptoms, which could then partially explain the unexpected findings that social concerns was not related to any of the symptom constellation of three anxiety disorders, especially social anxiety, or depression. Perhaps, in the present sample the description of the items in the social concerns subscale include either physical concerns or mental incapacitation or both. The overlap of items could result in social concerns contributing little to no unique variance in predicting the anxious and depressive symptoms yielding social concerns to not be a significant predictor of any of the anxiety or depressive symptoms. The mental incapacitation subscale together with physical concerns subscale may cover the construct of fear of publically observable symptoms. Perhaps mental incapacitation may be the more prominent underlying belief associated with symptoms of social anxiety rather than social concerns in both men and women. Additionally in men, both mental incapacitation and physical concerns may be beliefs underlying social anxiety symptoms.

Alternatively, it is possible that the results suggest that the ASI social concerns subscale may not be related to the social interaction component of social

anxiety. It could be proposed that the ASI social concerns scale may be related to other components of social anxiety which were not measured in the present study (e.g. fear others will notice anxiety symptoms, fear of being observed by others, performance anxiety). One could hypothesize that the anxiety sensitivity fear of publically observable symptoms may only be predictive of certain components of social anxiety, which would emphasize the importance of examining these disorders in terms of their cluster of symptoms. Examining the relationship between components of social anxiety and the lower order factors of AS may yield more consistent results.

In women, physical concerns predicted physiological hyperarousal; however, in men physical concerns did not predict these symptoms. In women, mental incapacitation predicted the remaining anxiety symptoms measured, that is, social anxiety symptoms and worry, and depressive symptoms. The unique relationship between physical concerns and physiological arousal observed in women falls directly in line with the multidimensional and hierarchical model of AS. In men, the relationship between the ASI subscales and the anxiety symptoms and depression shows an alternative differentiation. Unexpectedly in men, physical concerns differentiated social anxiety from physiological hyperarousal, worry, and depression. The lack of a predictive relationship between physical concerns and physiological hyperarousal in men is unclear and warrants further investigation.

The association observed between mental incapacitation and worry and depression, found in both samples, is congruent with the AS model. These findings lend support for the multidimensional and hierarchical model outlining fear of cognitive dyscontrol as a predictor of generalized anxiety disorder and depression. In both men and women, mental incapacitation predicted anxiety symptoms in addition to those proposed in the AS model. In men, it appears that there is a common orientation of the beliefs about anxious symptoms and their consequences. The present study found that mental incapacitation was associated with all the anxiety symptoms measured and depressive symptoms. Men experiencing anxious and depressive symptoms are likely to hold the belief that anxious symptoms which are specifically cognitively oriented (e.g., difficulty concentrating, nervousness) lead to harmful physical, psychological, and social consequences. It is possible that these specific types of beliefs underlie anxiety and depression in men.

In women, although the association between mental incapacitation and the anxiety and depressive symptoms was limited to social anxiety symptoms, worry, and depressive symptoms, one could still suggest that beliefs about cognitive dyscontrol is the most common orientation of AS beliefs present in anxiety and depression compared to the other two factors. Furthermore, as there were no sex differences between men and women on the AS mental incapacitation subscale, one could suggest that the fear of cognitive dyscontrol may be the most relevant component of AS that is associated with anxiety and

depression. These observations further reinforce the importance of studying AS in its multidimensional and hierarchical form, as opposed to unidimensionally, as studies can further refine the understanding of the relationship between AS and anxiety and depression.

The present study utilized an undergraduate sample to examine the multidimensional and hierarchical model of AS. Although a large non-clinical sample provides a good starting point for testing and evaluating models such as those presented here, future studies might sample individuals diagnosed with panic disorder, social anxiety disorder, generalized anxiety disorder, and depression, and examine whether these individuals can be differentiated based on the lower order factors of AS [e.g., expanding on Rector, et al.'s (2007) study to include those diagnosed with major depressive disorder]. Such studies could examine differences in the magnitude of the lower order factors across the disorders as well as within each disorder. For example, individuals with depression could present with higher fear of cognitive dyscontrol compared to the other lower order factors and potentially compared to individuals with other diagnoses (i.e., panic disorder, social anxiety disorder, and generalized anxiety disorder). Similarly, future studies might also examine the relationships observed between the AS factors and specific diagnostic presentations across sex as well. Future studies should also examine these relationships in a non-clinical community sample in order to establish a more comprehensive representation of the relationships between the lower order factors of AS and the mood disorders.

Age may also moderate the relationships between the lower order factors of AS and anxious and depressive symptoms as well as the magnitude of presentation of the lower order factors of AS. For example, older individuals may have greater fear of cognitive dyscontrol as compared to younger individuals as older individuals may have a heightened awareness of conditions which lead to cognitive problems that overall are more prevalent in their age bracket (e.g., aphasia, Alzheimer's disease, stroke); additionally, these discrepancies may result in different descriptions of the multidimensional and hierarchical structure of AS. It could also be examined whether the differential patterns of symptom-AS relationships observed in each sex group in this younger population persist to old age or whether different sex and AS relationships emerge across the lifespan.

The women's sample in this study was approximately three times as large as the men's sample. As a result, certain analyses resulted in statistical significance among women and not among men where the value of the statistic was comparable. Namely, the correlation between physical sensations and depressive symptoms, $r = .19$, was not significant among men whereas the correlations between social concerns and depression, $r = .17$, and social concerns and worry, $r = .15$ were significant in the women's sample. It is useful to interpret these correlations in terms of effect size rather than relying on null hypothesis testing. In these instances, one can conclude that the magnitude of the correlations between physical sensations and depressive symptoms in men and social concerns

and depression and worry in woman are small in effect size (Cohen & Cohen, 1983) and thus comparable. It is recommend that future studies aim to balance the sample size when examining equivalence between two groups and report the effect size of their statistical findings.

In the present study, as well as in previous investigations, the ASI social concerns subscale demonstrated poor reliability. Future studies could consider developing separate inventories which specifically measure each lower order factor of AS, since there is evidence from the present study to suggest that some of the lower order factors may have a wider spread influence on anxious and depressive symptoms. However, this study was unable to yield information about the relationship between fear of publically observable symptoms and anxious and depressive symptoms. As such, the results from this study are preliminary and are presented as a guide for future research in AS. It is recommended that researchers continue testing for sex differences that exist in anxiety and depression as such studies will improve our understanding of the specific risk factors in men and women for these disorders.

REFERENCES

- Abramowitz, J. S. (2006). *Understanding and treating obsessive-compulsive disorder: A cognitive-behavioral approach*. Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W. & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181.
- Amir, N., Coles, M. E., & Foa, E. B. (2002). Automatic and strategic activation and inhibition of threat-relevant information in posttraumatic stress disorder. *Cognitive Therapy and Research, 26*, 645-655.
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J. & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561-571.
- Beck, A. T. & Steer, R. A. (1990). Manual for the Beck Anxiety Inventory. San Antonio, TX: The Psychological Corporation.
- Bernstein, A., Zvolensky, M. J., Stewart, S. H., Comeau, M., & Leen-Feldner, E. W. (2006). Anxiety sensitivity taxonicity across gender among youth. *Behaviour Research and Therapy, 44*(5), 679-698.
- Blais, M. A., Otto, M. W., & Zucker, B. G. (2001). The Anxiety Sensitivity Index: Item analysis and suggestions for refinement. *Journal of Personality Assessment, 72*, 272-294.
- Calamari, J., Rector, N., Woodard, J., Cohen, R. J., & Chik, H. (2008). Anxiety sensitivity and obsessive-compulsive disorder. *Assessment, 15*, 351-363.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*(3), 316-336.

Articles Section

- Cohen, J., & Cohen, P. (1983). Applied multiple regression~correlation analysis for the behavioral sciences (2nd ed.). Hillsdale, N J: Erlbaum.
- Cox, B. J., Parker, J. D., & Swinson, R. P. (1996). Anxiety sensitivity: Confirmatory evidence for a multidimensional construct. *Behaviour Research and Therapy*, 34, 591-598
- Cox, B. J., Swinson, R. P., Shulman, I. D., Kuch, K., Reichman, J. T. (1993). Gender effects and alcohol use in panic disorder with agoraphobia. *Behaviour Research and Therapy*, 31(4), 413-416.
- Deacon, B. J., & Valentiner, D. P. (2001). Dimensions of anxiety sensitivity and their relationship to nonclinical panic. *Journal of Psychopathology and Behavioral Assessment*, 23(1), 25-33.
- Feldner, M. T., Zvolensky, M. J., Schmidt, N. B., & Smith, R. C. (2008). A prospective test of anxiety sensitivity as a moderator of the relation between gender and posttraumatic symptom maintenance among high anxiety sensitive young adults. *Depression and Anxiety*, 25(3), 190-199.
- Foot, M., & Koszycki, D. (2004). Gender Differences in Anxiety-Related Traits in Patients With Panic Disorder. *Depression and Anxiety*, 20(3), 123-130.
- Goldstein, A. J., & Chambless, D. L. (1978). A reanalysis of agoraphobia. *Behavior Therapy*, 9, 47-59.
- Goodin, B. R., McGuire, L. M., Stapleton, L. M., Quinn, N. B., Fabian, L. A., Haythornthwaite, J. A., & Edwards, R. R. (2009). Pain catastrophizing mediates the relationship between self-reported strenuous exercise involvement and pain ratings: Moderating role of anxiety sensitivity. *Psychosomatic Medicine*, 71(9), 1018-1025.
- Hayward, C., Killen, J. D., Kraemer, H. C., & Taylor, C. B. (2000). Predictors of panic attacks in adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, 39, 207-0214.
- Hazen, A. L., Walker, J. R., & Stein, M. B. (1994) Comparison of anxiety sensitivity in panic disorder and social phobia. *Journal of Anxiety Disorders*, 1, 298-301.
- Hofmann, S. G., (2007). Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive Behaviour Therapy*, 36, 195-209.
- Hughes, A. A., Heimberg, R. G., Coles, M. E., Gibb, B. E., Liebowitz, M. R., & Schneier, F. R. (2006). Relations of the factors of the tripartite model of anxiety and depression to types of social anxiety. *Behaviour Research And Therapy*, 44(11), 1629-1641.
- Kashdan, T. B. (2002). Social anxiety dimensions, neuroticism, and the contours of positive psychological functioning. *Cognitive Therapy and Research*, 26(6), 789-810.
- Katz, J., Martin, A. L., Pagé, M., & Calleri, V. (2009). Alexithymia and fear of pain independently predict heat pain intensity ratings among undergraduate university students. *Pain Research & Management*, 14(4), 299-305.
- Keogh, E. (2004). Investigating invariance in the factorial structure of the anxiety sensitivity index across adult men and women. *Journal of Personality Assessment*, 83(2), 153-160.
- Lewis, A. R., Zinbarg, R. E., Mineka, S., Craske, M. G., Epstein, A., & Griffith, J. W. (2010). The relationship between anxiety sensitivity and latent symptoms of

- emotional problems: A structural equation modeling approach. *Behaviour Research and Therapy*, 48(8), 761-769.
- Lilienfeld, S. O. (1996). Anxiety sensitivity is not distinct from trait anxiety. In R. Rapee (Ed.), *Current controversies in the anxiety disorders* (pp. 228–244). New York, NY: Guilford Press.
- Lilienfeld, S. O., Turner, S. M., & Jacob, R. G. (1993). Anxiety sensitivity: Theoretical and methodological issues. *Advances in Behaviour Research and Therapy*, 13, 147-183.
- Lovibond, P. F. & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33, 335-343.
- Maller, R., & Reiss, S. (1992). Anxiety sensitivity in 1984 and panic attacks in 1987. *Journal of Anxiety Disorders*, 6, 241-247.
- Mattick, R.P., & Clarke, C.J. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, 36, 455-470.
- McKay, D., Abramowitz, J. S., Calamari, J., Kyrios, M., Sookman, D., Taylor, S., & Wilhelm, S. (2004). A critical evaluation of obsessive-compulsive disorder subtypes: Symptoms versus mechanisms. *Clinical Psychology Review*, 24, 283-313.
- McLeish, A. C., Zvolensky, M. J., & Luberto, C. M. (2011). The role of anxiety sensitivity in terms of asthma control: A pilot test among young adult asthmatics. *Journal of Health Psychology*, 16(3), 439-444.
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 28, 487-495.
- Mohlman, J., & Zinbarg, R. E. (2000). The structure and correlates of anxiety sensitivity in older adults. *Psychological Assessment*, 12(4), 440-446.
- Nunnally, J. (1978). *Psychometric Theory*. New York, NY: Cambridge University Press.
- O'Connor, R. M., Farrow, S., & Colder, C. R. (2008). Clarifying the anxiety sensitivity and alcohol use relation: Considering alcohol expectancies as moderators. *Journal of Studies on Alcohol and Drugs*, 69(5), 765-772.
- Olatunji, B. O., & Wolitzky-Taylor, K. B. (2009). Anxiety sensitivity and the anxiety disorders: A meta-analytic review and synthesis. *Psychological Bulletin*, 135, 974-999.
- Osman, A., Gutierrez, P. M., Barrios, F. X., Kopper, B. A., & Chiros, C. E. (1998). The Social Phobia and Social Interaction Anxiety Scales: Evaluation of psychometric properties. *Journal of Psychopathology And Behavioral Assessment*, 20(3), 249-264.
- Peterson, R. A., & Heilbronner, R. L. (1987). The Anxiety Sensitivity Index: Construct validity and factor analytic structure. *Journal of Anxiety Disorders*, 1(2), 117-121.
- Plehn, K., & Peterson, R. A. (2002). Anxiety sensitivity as a predictor of the development of panic symptoms, panic attacks, and panic disorder: A prospective study. *Journal of Anxiety Disorders*, 16, 455–474. doi:10.1016/S0887-6185(02)00129-9

Articles Section

- Rector, N. A., Szacun-Shimizu, K., & Leybman, M. (2007). Anxiety sensitivity within the anxiety disorders: Disorder-specific sensitivities and depression comorbidity. *Behaviour Research and Therapy, 45*, 1967-1975.
- Reiss, S. (1991). Expectancy model of fear, anxiety, and panic. *Clinical Psychology Review, 11*, 141-153.
- Reiss, S., & McNally, R. J. (1985). The expectancy model of fear. In S. Reiss & R. R. Bootzin (Eds.), *Theoretical issues in behavior therapy* (pp. 107-121). London, England: Academic Press.
- Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the predictions of fearfulness. *Behaviour Research and Therapy, 24*, 1-8.
- Rodriguez, B. F., Bruce, S. E., Pagano, M. E., Spencer, M. A., & Keller, M. B. (2004). Factor structure and stability of the Anxiety Sensitivity Index in a longitudinal study of anxiety disorder patients. *Behaviour Research and Therapy, 42*, 79-91.
- Schmidt, N. B., & Joiner, T. E. (2002). Structure of the Anxiety Sensitivity Index psychometrics and factor structure in a community sample. *Journal Of Anxiety Disorders, 16*(1), 33-49.
- Schmidt, N. B., & Koselka, M. (2000). Gender differences in patients with panic disorder: Evaluating cognitive mediation of phobic avoidance. *Cognitive Therapy and Research, 24*(5), 533-550.
- Schmidt, N. B., Lerew, D. R., & Jackson, R. J. (1999). Prospective evaluation of anxiety sensitivity in the pathogenesis of panic: Replication and extension. *Journal of Abnormal Psychology, 108*, 532-537.
- Spice, K., Jones, S. L., Hadjistavropoulos, H. D., Kowalyk, K., & Stewart, S. H. (2009). Prenatal fear of childbirth and anxiety sensitivity. *Journal of Psychosomatic Obstetrics & Gynecology, 30*(3), 168-174.
- Stewart, S. H., Taylor, S., & Baker, J. M. (1997). Gender differences in dimensions of anxiety sensitivity. *Journal of Anxiety Disorders, 11*(2), 179-200.
- Telch, M. J., Lucas, J. A., & Nelson, P. (1989). Nonclinical panic in college students: An investigation of prevalence and symptomatology. *Journal of Abnormal Psychology, 98*(3), 300-306.
- Van Dam, N. T., Earleywine, M., & Forsyth, J. P. (2009). Gender bias in the sixteen-item Anxiety Sensitivity Index: An application of polytomous differential item functioning. *Journal of Anxiety Disorders, 23*(2), 256-259.
- Viana, A. G., & Rabian, B. (2009). Fears of cognitive dyscontrol and publicly observable anxiety symptoms: Depression predictors in moderate-to-high worriers. *Journal of Anxiety Disorders, 23*(8), 1126-1131.
- Wald, J., & Taylor, S. (2007). Efficacy of interoceptive exposure therapy combined with trauma-related exposure therapy for posttraumatic stress disorder: A pilot study. *Journal of Anxiety Disorders, 21*, 1050-1060.
- Wright, K. D., Asmundson, G. G., McCreary, D. R., Stewart, S. H., McLaughlin, E., Comeau, M., & Walsh, T. M. (2010). Confirmatory factor analysis of the Childhood Anxiety Sensitivity Index: A gender comparison. *Cognitive Behaviour Therapy, 39*(3), 225-235.
- Zinbarg, R. E., & Barlow, D. H. (1996). Structure of anxiety and the anxiety disorders: A hierarchical model. *Journal of Abnormal Psychology, 105*(2), 181-193.

- Zinbarg, R. E., Barlow, D. H., & Brown, T. A. (1997). Hierarchical structure and general factor saturation of the Anxiety Sensitivity Index: Evidence and implications. *Psychological Assessment, 9*, 277-284.
- Zinbarg, R. E., Brown, T. A., Barlow, D. H., & Rapee, R. M. (2001). Anxiety sensitivity, panic, and depressed mood: A reanalysis teasing apart the contributions of the two levels in the hierarchical structure of the anxiety sensitivity index. *Journal of Abnormal Psychology, 110*, 372-377.
- Zvolensky, M. J., McNeil, D. W., Porter, C. A., & Stewart, S. H. (2001). Assessment of anxiety sensitivity in young American Indians and Alaska Natives. *Behaviour Research and Therapy, 39*(4), 477-493.
- Zvolensky, M. J., Bernstein, A., Cardenas, S., Colotla, V. A., Marshall, E. C., & Feldner, M. T. (2007). Anxiety sensitivity and early relapse to smoking: A test among Mexican daily, low-level smokers. *Nicotine & Tobacco Research, 9*(4), 483-491.

Copyright of Journal of Cognitive & Behavioral Psychotherapies is the property of International Institute for the Advanced Studies of Psychotherapy & Applied Mental Health and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.