



# The temporal course of anxiety sensitivity in outpatients with anxiety and mood disorders: Relationships with behavioral inhibition and depression

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## ABSTRACT

The present study evaluated the temporal course of three dimensions of anxiety sensitivity (AS; concerns over physical symptoms, mental incapacitation, and social embarrassment) and their relationships with behavioral inhibition (BI) and depression (DEP) in 606 outpatients with anxiety and mood disorders. A semi-structured interview and self-report questionnaires were administered on three occasions over a two-year period. All three constructs decreased over the study period and AS temporally functioned more similar to DEP than BI. Cross-sectional and temporal correlations supported the discriminant validity of AS from BI. As expected, initial levels of BI predicted less improvement in all AS dimensions. In contrast, higher initial levels of mental incapacitation AS were associated with *greater* improvement in DEP. Our results are discussed in regard to the measurement of AS in clinical samples, conceptualizations of AS as a lower-order vulnerability, and prognostic implications of directional paths between BI and AS and AS and DEP.

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## 1. Introduction

Anxiety sensitivity (AS) is defined as a fear of anxiety and anxiety-related sensations. AS is a heritable vulnerability (Stein, Jang, & Livesley, 1999) toward beliefs that anxiety symptoms may have harmful physical (e.g., heart attack or stroke), social (e.g., embarrassment), and psychological (e.g., indication that one is “going crazy”) consequences (Reiss, 1987). The Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1987) is the most widely used measure of AS in research and clinical practice. Although the ASI was originally hypothesized to have a unidimensional structure (Reiss, Peterson, Gursky, & McNally, 1986), subsequent psychometric evaluations have supported a hierarchical factor structure (Rodriguez, Bruce, Pagano, Spencer, & Keller, 2004; Zinbarg, Barlow, & Brown, 1997). According to the hierarchical model, the ASI consists of three lower-order factors representing fear of the physical (e.g., heart palpitations; ASI-P), social (e.g., appearing nervous; ASI-S), and mental (e.g., being unable to keep focused, feeling “nervous”; ASI-M) consequences of anxiety, as well as a single higher-order factor reflecting general AS. Although AS and its dimensions have often been studied in relation to other personality/temperament vulnerabilities (e.g., trait anxiety) and the anxiety disorders (e.g., panic disorder, social

phobia), research has not extensively evaluated the relationships between AS and behavioral inhibition (BI) or depression (DEP).

### 1.1. Anxiety sensitivity and behavioral inhibition

There has been considerable debate as to placement of AS within a broader nomological network of temperament/personality vulnerabilities believed to influence psychopathology (e.g., trait anxiety, neuroticism). Specifically, although AS was originally conceptualized to be distinct from trait anxiety (i.e., AS is a fearful response to anxiety-related symptoms, trait anxiety is a fearful response to general stressors; McNally, 1989), others argued that AS lacked discriminant validity from trait anxiety (Jacob & Lilienfeld, 1991; Lilienfeld, Jacob, & Turner, 1989). Subsequent theory and research focused on AS and trait anxiety have reconciled much of this debate. For instance, conceptualizations of AS as a lower-order personality construct (Clark, Watson, & Mineka, 1994; Lilienfeld, Turner, & Jacob, 1993) have been supported by hierarchical structural models of AS and trait anxiety (i.e., significant path from trait anxiety to AS; Taylor, 1995). Such findings have encouraged research examining the relationship between AS and constructs closely related to trait anxiety, including neuroticism (Norton, Sexton, Walker, & Norton, 2005), negative affect (Zinbarg & Barlow, 1996), and negative emotionality (Lilienfeld, 1997).

BI is another construct similar to trait anxiety that is thought to be related to AS (Lilienfeld et al., 1993). Gray (1987) defined BI as a temperament that influences an individual's experience of negative affect (e.g., anxiety) and directs behavior in response

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to threat, punishment, and novelty (e.g., avoidance). Although AS has been studied in relation to higher-order vulnerabilities like BI, nearly all of the extant literature has been cross-sectional in nature (e.g., incremental validity of AS in predicting current symptoms; Norton et al., 2005). Conversely, longitudinal studies have separately documented reductions in BI (e.g., Brown, 2007) and AS (e.g., Smits, Berry, Tart, & Powers, 2008) over time and with treatment. However, there has yet to be an examination of individual differences in the temporal course of AS dimensions or their interrelationships (e.g., discriminant validity, directional paths) with BI. Although AS is conceptualized as a vulnerability (Reiss, 1987), AS dimensions also resemble features of psychopathology (e.g., fear of physical symptoms and panic disorder; fear of social consequences and social phobia). Thus, AS may temporally function like a higher-order vulnerability (i.e., stability increasing as a function of initial severity) or like a DSM disorder construct (i.e., stability decreasing as a function of initial severity; Brown, 2007; Curran, Stice, & Chassin, 1997) in clinical samples receiving treatment. In addition to enhancing our understanding of the hierarchical structure of emotional disorders (see Watson, 2005), longitudinal directional relationships between AS and BI (i.e., BI predicting extent of change in AS) could have important implications regarding treatment response (e.g., psychopathological outcomes) and focus (e.g., specifically targeting BI in treatment).

### 1.2. Anxiety sensitivity and depression

The confluence of AS and symptoms of anxiety, occurring in the context of a generalized disposition to experience heightened levels of negative affect (e.g., BI), is presumed to lead to manifestation and maintenance of psychopathology (Barlow, 2002). Although AS was originally conceptualized as related to anxiety and panic (Reiss et al., 1986), studies have also found elevated levels of AS among individuals with DEP (e.g., Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995). Others extended these findings by clarifying that the relationship between AS and DEP may be specific to mental incapacitation AS (Taylor, Koch, Woody, & McLean, 1996), leading some to hypothesize that mental incapacitation concerns may amplify symptoms of DEP during its course (e.g., interpreting concentration difficulties as signs of an impairing depressive state; Cox, Taylor, & Enns, 1999; Cox, Enns, Freeman, & Walker, 2001). Although subsequent research has predominantly offered support for the unique relationship between the mental incapacitation dimension of AS and DEP (e.g., Brown, Barlow, & Rapee, 2001; Cox et al., 1999, 2001; Rector, Szacun-Shimizu, & Leybman, 2007; Schmidt, Lerew, & Joiner, 1998; Zinbarg, Brown, Barlow, Rapee, 2001), it is noteworthy that some studies have also found significant associations between the other AS dimensions and DEP (ASI-S, Rodriguez et al., 2004; ASI-P, Grant, Beck, & Davila, 2007; ASI-S and ASI-P, McWilliams, Becker, Margrat, Clara, & Vriends, 2007).

Although the aforementioned literature has been useful in establishing the relationship between AS and DEP, it has been limited by examining their relations almost exclusively in a cross-sectional fashion. Moreover, much of the extant literature on AS and DEP has relied on categorical measurement of DEP (e.g., McWilliams et al., 2007; Rodriguez et al., 2004), ignoring other important clinical information such as individual differences in symptom severity (cf. Brown and Barlow, 2005, 2009). Although the longitudinal relationship between AS and DEP severity has rarely been discussed, researchers have more generally hypothesized that higher levels of temperament/personality traits should be associated with a poorer prognosis of psychopathology (e.g., less decreases in Axis I symptoms over time and with treatment; Brown, 2007; Clark et al., 1994).

Studies of the longitudinal relationship between dimensions of AS and DEP have been sparse and produced mixed findings. For example, whereas Schmidt et al. (1998) found that fears of mental incapacitation predicted more severe levels of DEP over a five-week period, others have shown that fears of physical symptoms are associated with increased levels of DEP over a one-year period (Grant et al., 2007). More recently, Olatunji et al. (2008) found that none of the AS dimensions predicted the rate of reduction in DEP symptoms among 38 patients with generalized anxiety disorder receiving pharmacotherapy. Unfortunately, generalizability of these studies is limited due to use of non-clinical samples (Grant et al., 2007) and small clinical samples with limited diagnostic coverage (Olatunji et al., 2008; Schmidt et al., 1998). Additional longitudinal research is needed to further clarify how AS, particularly the fear of mental incapacitation, may influence the course of DEP in clinical samples.

### 1.3. Present study

The present investigation aims to advance the extant literature on AS, BI, and DEP by examining their temporal course and interrelationships in a diverse sample of outpatients with anxiety and mood disorders. Test–retest correlations, effect size calculations, and latent growth curve modeling (LGM) were used to examine dimensions of AS, BI, and DEP over a two-year period. Because the majority of participants received treatment after the first assessment, all constructs were expected to decrease over the study period. However, unconditional LGMs were conducted to determine if the temporal course of AS was more similar to BI or DEP. In support of their discriminant validity, AS dimensions and BI were expected to be distinguishable at intake and the extent of change in all three AS dimensions was anticipated to be distinct from change in BI. Given conceptualizations of BI as a higher-order vulnerability, it was hypothesized that higher initial levels of BI would predict less reduction in all three AS dimensions, but that none of the AS dimensions would predict change in BI. Based on literature in support of a relationship between concerns of mental incapacitation and DEP, this AS dimension was expected to evidence stronger correlations with DEP at intake than the physical symptom or social dimensions of AS. Mental incapacitation AS was also expected to predict the temporal course of DEP, such that greater concerns of incapacitation at intake would be associated with less decrease in DEP.

## 2. Method

### 2.1. Participants

The sample consisted of 606 outpatients who presented for assessment or treatment at the Center for Anxiety and Related Disorders. The sample was predominantly female (63%) and White (89%), with smaller percentages identifying as African American (4%), Asian (3%), and Latino/Hispanic (3%). The average age of the sample was 34.72 years ( $SD = 11.89$ ) with a range from 18 to 74. Intake diagnoses (Time 1, T1) were established with the Anxiety Disorders Interview Schedule for DSM-IV: Lifetime Version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994), a semistructured interview designed to assess the fourth edition *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000) anxiety, mood, somatoform, and substance use disorders. Patients were reevaluated at 12 months (Time 2, T2) and 24 months (Time 3, T3) with the follow-up version of the ADIS-IV-L (ADIS-IV-FU), which is identical except that (a) past diagnoses are not assessed, and (b) a section is included to assess treatment follow-up (e.g., nature of treatments received since intake). When admin-

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