Personality and Individual Differences 55 (2013) 640–644

Contents lists available at SciVerse ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Anxiety sensitivity and intolerance of uncertainty: Evidence of incremental specificity in relation to health anxiety

Thomas A. Fergus [a,*], Joseph R. Bardeen [b,c,d]

[a] Department of Psychology and Neuroscience, Baylor University, Waco, TX 76798, United States
[b] Department of Psychology, Northern Illinois University, DeKalb, IL, United States
[c] Department of Psychiatry and Human Behavior, University of Mississippi Medical Center, Jackson, MS, United States
[d] G.V. (Sonny) Montgomery VA Medical Center, Jackson, MS, United States

ARTICLE INFO

Article history:
Received 22 December 2012
Received in revised form 3 May 2013
Accepted 7 May 2013
Available online 10 June 2013

Keywords:
Anxiety sensitivity
Health anxiety
Intolerance of uncertainty
Negative affect

ABSTRACT

Anxiety sensitivity (AS) reflects the fear of arousal-related sensations and intolerance of uncertainty (IU) represents the dispositional fear of the unknown. Within cognitive–behavioral models, AS and IU are individual difference variables considered central to the phenomenology of health anxiety. However, prior studies have cast doubt on whether both variables incrementally contribute to our understanding of health anxiety. Addressing limitations of these prior studies, the present study examined the incremental specificity of AS and IU as these two variables relate to health anxiety in a large medically healthy sample of community adults ($N = 474$). Both AS and IU incrementally contributed to the concurrent prediction of health anxiety beyond both negative affect and one another. However, within these analyses, the physical dimension of AS and the inhibitory dimension of IU were the only AS and IU dimensions to evidence incremental specificity in relation to health anxiety.

1. Introduction

Within hierarchical models of emotional disorders there exists a broad, non-specific higher-order factor of negative affect/neuroticism that spans across these disorders (e.g., Watson, 2005). Given that this higher-order factor indiscriminately relates to all emotional disorders, researchers have started to consider the role of lower-order factors that might allow for finer, more precise distinctions to be made among phenomena of interest. Anxiety sensitivity (AS) and intolerance of uncertainty (IU) are two lower-order factors within the broader context of negative affect that have garnered particular interest from researchers (Norton & Mehta, 2007; Norton, Sexton, Walker, & Norton, 2005; Sexton, Norton, Walker, & Norton, 2003). AS reflects the fear of arousal-related sensations (Taylor et al., 2007) and IU represents the dispositional fear of the unknown (Carleton, 2012). AS and IU are independent, albeit strongly related ($r = 0.68$), constructs (Carleton, Sharpe, & Asmundson, 2007). Although it was once thought that AS and IU might be particularly relevant to only certain emotional disorders, these two individual difference variables appear best conceptualized as spanning across multiple mood and anxiety disorders (Norton & Mehta, 2007; Norton et al., 2005; Sexton et al., 2003). Thus, AS and IU may have transdiagnostic importance.

Despite these findings, the extant literature provides equivocal conclusions as to the relevance of AS and IU to health anxiety. Asmundson and Taylor (2005) stated that "most cognitive–behavioral researchers and practitioners use the term *health anxiety* to describe the wide range of worry that people can have about their health" (p. 5, emphasis in original). Within cognitive–behavioral models, health anxiety is conceptualized as arising from misinterpretations of body sensations (e.g., heart palpitations) or symptoms (e.g., sore throat) as being indicative of a medical problem (Abramowitz & Braddock, 2008; Taylor & Asmundson, 2004). AS and IU are both risk factors for health anxiety within cognitive–behavioral models. For example, Abramowitz and Braddock noted that the fear of arousal-related sensations leads individuals to mistakenly believe that innocuous sensations/symptoms indicate a medical problem, thus resulting in health anxiety. Abramowitz and Braddock further noted that individuals with health anxiety often believe that it is possible, and necessary, to gain certainty as to their health status. Difficulty tolerating health status-related uncertainty may also lead to health anxiety.

Extant data broadly support the importance given to both AS and IU within cognitive–behavioral models of health anxiety. For example, both variables significantly positively correlate with health anxiety (Abramowitz, Deacon, & Valentiner, 2007) and individuals with severe health anxiety endorse having especially high levels of AS and IU (Deacon & Abramowitz, 2008). However, there exists conceptual overlap among AS and IU, as both variables pertain to fear or anxiety related to the unknown (Carleton, Sharpe, &

* Corresponding author. Tel.: +1 254 710 2651; fax: +1 254 710 3033.
E-mail address: Thomas_Fergus@baylor.edu (T.A. Fergus).

0191-8869/$ - see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.paid.2013.05.016

Asmundson, 2007). Because of this overlap, it is important to examine the independence of AS and IU as these two variables relate to health anxiety. Unfortunately, research examining the incremental specificity of AS and IU in relation to health anxiety has produced discordant findings. In two studies (Norton et al., 2005; Sexton et al., 2003), AS, but not IU, was found to significantly relate to health anxiety after controlling for negative affect and the other variable (i.e., AS or IU). Boelen and Carleton (2012) failed to replicate these results and found that neither AS nor IU was significantly related with health anxiety after controlling for negative affect and the other variable. Based on these results, it appears that cognitive–behavioral models may place too great an emphasis on AS and IU as they relate to health anxiety.

Although informative, limitations of these prior studies preclude firm conclusions as to the interrelations among AS, IU, and health anxiety. Specifically, the sample sizes in these studies were relatively small (*N*s ranging from 91 to 126), which could have reduced the statistical power necessary to detect unique relations among the targeted variables. In addition, the choice of health anxiety measures was not ideal. For example, Boelen and Carleton (2012) used a dichotomously scored version of the Whiteley Index (WI; Pilowsky, 1967) to assess health anxiety. As noted by Welch, Carleton, and Asmundson (2009), the use of a 5-point scale when using the WI to assess for health anxiety is preferred and likely leads to more valid results. Another limitation of these prior studies is the failure to use contemporary operationalizations of both AS and IU. For example, Boelen and Carleton (2012) operationalized IU using Carleton, Norton, and Asmundson's (2007) contemporary two-dimensional conceptualization, but the other two studies used a unidimensional conceptualization of IU (Norton et al., 2005; Sexton et al., 2003). IU consists of prospective (i.e., cognitive) and inhibitory (i.e., behavioral) IU within Carleton, Norton, and Asmundson's conceptualization. It is important to examine these IU dimensions separately, as these two dimensions have distinct correlates (McEvoy & Mahoney, 2011). Along similar lines, AS was treated as a unidimensional construct in all three prior studies. However, research suggests that AS is best conceptualized as consisting of three separate dimensions. The three AS dimensions include the fear of arousal-related sensations as a result of cognitive (i.e., mental incapacitation), physical (i.e., physical calamity), or social (i.e., public embarrassment) concerns (Taylor et al., 2007). Among the AS dimensions, the physical dimension is the only one that uniquely relates to health anxiety (Olatunji et al., 2009; Stewart, Sherry, Watt, Grant, & Hadjistavropoulos, 2008). Based on these findings, it is important to use a multidimensional conceptualization of AS in health anxiety research.

To address these limitations, the present study was completed using a sample ($N = 474$) that was substantially larger than the samples described above (Boelen & Carleton, 2012; Norton et al., 2005; Sexton et al., 2003). We expected that the present sample size would allow for adequate statistical power, as an a-priori power analysis (using Faul, Erdfelder, Buchner, & Lang, 2009) identified a sample of 395 respondents as needed to achieve statistical power of 0.80 when attempting to determine the significance of a single regression coefficient with a small effect size (Cohen's $f^2 = 0.02$) and eight total predictors in a regression model. A small effect size was chosen based on results from Boelen and Carleton (2012).[1] Addressing noted measurement limitations of prior research, we used the WI version recommended by Welch et al. (2009) to assess health anxiety, as well as contemporary multidimensional operationalizations of both AS (Taylor et al., 2007) and IU (Carleton, Norton, & Asmundson, 2007), in the present study.

[1] A post-hoc power analysis indicated that we achieved adequate statistical power (i.e., .87) for the detection of small effects in the present study.

Consistent with prior research (Boelen & Carleton, 2012; Olatunji et al., 2009; Stewart et al., 2008), we predicted that all AS (cognitive, physical, and social) and IU (prospective and inhibitory) dimensions would significantly correlate with health anxiety. Incremental specificity was investigated by examining whether the AS and IU dimensions shared unique relations with health anxiety after controlling for negative affect and the other set of dimensions (AS or IU). We predicted that physical AS and both IU dimensions (prospective and inhibitory) would demonstrate incremental specificity in relation to health anxiety. This prediction was based on the following considerations. Given that previous research has indicated that physical AS is the AS dimension of particular relevance to health anxiety (Olatunji et al., 2009; Stewart et al., 2008), we expected robust relations between this AS dimension and health anxiety. McEvoy and Mahoney (2011) suggested that prospective IU is particularly relevant to both generalized anxiety and obsessive–compulsive symptoms, whereas inhibitory IU is particularly relevant to panic symptoms. Because health anxiety shares strong conceptual ties with these three symptom types (Abramowitz & Braddock, 2008), we predicted that both IU dimensions would share unique relations with health anxiety.

As described, AS and IU are both prominently featured within cognitive–behavioral models of health anxiety, which has led researchers to develop intervention strategies to target the impact of both variables on health anxiety (Abramowitz & Braddock, 2008). Given that research has cast doubt on the relative importance of AS and IU to health anxiety (Boelen & Carleton, 2012; Norton et al., 2005; Sexton et al., 2003), further exploration of the interrelations among AS, IU, and health anxiety is needed. Results showing that AS and IU fail to evidence incremental specificity in relation to health anxiety even after addressing the limitations of prior studies, would suggest that the importance of these two variables to health anxiety might be overstated within cognitive–behavioral models of health anxiety. If such a pattern of relations emerges, using intervention strategies that seek to reduce the impact of AS and/or IU on health anxiety may have little clinical utility.

2. Method

2.1. Participants

The sample consisted of 474 medically healthy adults. The mean age of the sample was 33.3 years ($SD = 12.2$). The majority of participants self-identified as female (55.5%), received at least a two-year college degree (59.5%), and worked at least part-time (71.0%). In terms of racial/ethnic identification, 78.5% of respondents self-identified as Caucasian, 6.5% as African American, 6.3% as Asian, 3.8% as Hispanic, and 4.9% endorsed "Other."

2.2. Measures

2.2.1. Anxiety Sensitivity Index-3 (Taylor et al., 2007)

The ASI-3 is an 18-item measure that assesses cognitive (e.g., *When I feel "spacey" or spaced out I worry that I may be mentally ill*), physical (e.g., *When I notice that my heart is beating rapidly, I worry that I might have a heart attack*), and social (e.g., *When I tremble in the presence of others, I fear what people might think of me*) dimensions of AS using a 5-point scale (ranging from 0 to 4). The ASI-3 has shown strong convergent correlations (*r*s ranging from 0.83 to 0.99) with other measures of AS (Taylor et al., 2007).

2.2.2. Intolerance of Uncertainty Scale-12 item version (IUS-12; Carleton, Norton, & Asmundson, 2007)

The IUS-12 is a 12-item short-form of the original 27-item IUS (Freeston, Rheaume, Letarte, Dugas, & Ladouceur, 1994). The