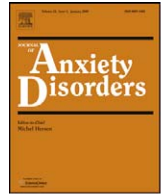
Journal of Anxiety Disorders 23 (2009) 942–949

Contents lists available at ScienceDirect

Journal of Anxiety Disorders



Construct validity and vulnerability to anxiety: A cognitive interviewing study of the revised Anxiety Sensitivity Index

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ARTICLE INFO

Article history:
Received 3 February 2009
Received in revised form 31 May 2009
Accepted 5 June 2009

Keywords:
Anxiety
Vulnerability
Construct validity
Cognitive therapy

ABSTRACT

The Anxiety Sensitivity Index (ASI; Reiss, S., Peterson, R. A., Gursky, D. M., & McNally, R. J. (1986). Anxiety sensitivity, anxiety frequency and the prediction of fearfulness. *Behaviour Research and Therapy*, *24*, 1–8) is probably the most widely used measure of cognitive vulnerability to anxiety. However, there have been periodic doubts expressed about whether it measures beliefs about the negative consequences of anxiety symptoms, as it purports to, or actual anxiety experiences. The present study investigated the construct validity of the revised ASI using a cognitive interviewing approach. Sixteen outpatients with anxiety problems responded to ASI-R items and items from another measure of vulnerability to anxiety, the Anxiety Attitude and Belief Scale, while thinking aloud. The resulting verbal protocols were coded according to the apparent cognitive processes respondents engaged in when answering the items. Responses to the revised ASI-R more often entailed retrieval of past episodes of anxiety, and participants more frequently formulated their responses based on judgments of the occurrence or intensity of feelings rather than on the appraisal of anticipated consequences of what was described in the items. These findings potentially have significant implications for interpretation of results from the large body of literature using the different versions of the ASI.

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Research into cognitive-behavioral therapy (CBT) and its model of psychopathology (Beck, 1976; Beck & Emery, 1985) has embraced a wide variety of methodologies but, in common with much of psychology, has had a particular affinity for questionnaire-based research. This has been the basis of a number of criticisms (Brown, MacLeod, Tata, & Goddard, 2002; Coyne & Gotlib, 1983; Hammen & Krantz, 1985; Hollon & Bemis, 1981). To different degrees, these criticisms share a concern about whether scores on putative cognitive measures have been shown conclusively to reflect variations in the underlying target phenomena or, indeed, whether they actually measure cognition. This focus echoes recent trends in measurement theory (Borsboom, Mellenbergh, & Van Heerden, 2004; Embretson, 1983) that seek to address the limitations of the accepted notions of construct validity. In particular, these authors have questioned sufficiency of the prevailing paradigm, within which the validity of an instrument rests on establishing a pattern of findings that is consistent with the relevant theory (epitomized by Cronbach & Meehl's, 1955, so-called "nomological net"). Meanwhile, within the growing methodology subfield known as cognitive aspects of survey methodology (CASM; Lessler, Tourangeau, & Salter, 1989) the technique of cognitive interviewing has been developed to identify the mechanisms involved in responding to self-report instruments to help ensure that these plausibly reflect the intended underlying target phenomena.

The central concern of the critics of the classical notion of construct validity is its susceptibility to inferential ambiguity, particularly lack of a basis for distinguishing the preferred interpretation of a pattern of associations from a less preferred one that explains the pattern just as well. Within the CBT literature, it was precisely criticisms along these lines that were at the heart of an energetic debate concerning the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986), one of the most widely used measures of cognitive vulnerability to anxiety. Anxiety sensitivity is defined as the fear of anxiety symptoms based on beliefs about their harmful consequences. The psychometric soundness of the ASI has been amply documented (Cox, Borger, & Enns, 1999). It correlates with and predicts measures of fear and panic; for example, it was shown to predict the development of panic attacks following stressful military training (Schmidt, Lerew, & Jackson, 1997). The ASI is associated in particular with agoraphobia and panic disorder, in which the experience of the fear reaction itself is the major source of distress

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doi:10.1016/j.janxdis.2009.06.001

(Reiss, 1991). However, in the course of interchanges with ASI researchers, Lilienfeld and colleagues made a number of cogent criticisms of the ASI that raise significant questions about its validity:

1. *Questionable face validity*. Lilienfeld, Jacob, and Turner (1989, p. 100) noted that "inspection of the item content of the ASI reveals that virtually all of the items appear to tap fear of anxiety and of anxiety symptoms (e.g., 'It scares me when I am nervous,' 'When I notice that my heart is beating rapidly, I worry that I might have a heart attack'), rather than beliefs concerning the negative consequences of anxiety, as claimed by the test's developers. [The authors] in effect make the unsubstantiated assumption that individuals who fear the consequences of anxiety necessarily possess cognitions that anxiety has harmful consequences."
2. *Content overlap with criterion variables*. "[B]ecause the word "scare" or "scares" appears in eight of the ASI's 16 items, a more parsimonious explanation for the partial correlation between the ASI and the [Fear Survey Schedule II] is that one measure of fear is highly associated with another measure of fear." (Lilienfeld, Turner, & Jacob, 1993, p. 168). With regard to comparisons of ASI scores between panic and other diagnostic groups, they state "because many of the ASI's items assess symptoms that are already known to be prevalent among panic disordered patients, such comparisons are not especially informative vis-a-vis the ASI's construct validity and provide little or no new information regarding panic disorder" (Lilienfeld, Turner, & Jacob, 1996, p. 413).
3. *Double-barreled items*. There is no way of knowing from a low score on an ASI item if the respondent does not often experience the sensation in question or if they experience it but are not scared of it. "This could produce a spurious correlation between the ASI and panic disorder (as well as similar criteria), because panic disorder patients are more likely than other subjects to experience anxiety-related symptoms... Indeed, because many of the items on the ASI refer explicitly to panic symptoms, it may be this shared content, rather than the AS construct per se, that is primarily responsible for the ASI's relation to panic disorder and related criteria" (Lilienfeld et al., 1993, pp. 166–167).

Arguments as to the dimensionality of the ASI and its relationship to trait anxiety also featured in this debate. However, the narrower criticisms summarized above pertaining to the basis upon which ASI scores vary are more fundamental and would potentially make these further considerations moot.

The response of some ASI researchers has been largely to reassert the intended purpose of the ASI, namely to assess beliefs about the consequences of anxiety rather than the frequency of anxiety, without providing evidence that the ASI is a valid means for meeting this aim (Taylor, 1996, p. 433; Reiss, 1997, p. 208). However, other ASI researchers have acknowledged the aptness of these criticisms. Thus, McNally (1999, p. 10) has concurred that the ASI does not, on its face, appear to assess beliefs, and that whether or not it does so in practice is a valid empirical question. Similarly, Cox et al. (1999) have stated that "the question remains as to whether the ASI items assess beliefs independent of occurrences of relevant fear experiences" (p. 143).

The present study was undertaken to investigate these aspects of the construct validity of an expanded version of the ASI, the ASI-R. The ASI-R (Taylor & Cox, 1998a) is a superset of the original ASI consisting of 10 of the original 16 ASI items along with 26 novel items. The authors' motivation in developing the ASI-R was to have available a large enough item set to settle the question of the dimensionality of the AS construct. The instructions and the structure and wording of the items remained the same as for the original ASI. The same can be said of the more recent ASI-3 (Taylor et al., 2007), a verbatim subset of the ASI-R which also retains the same instructions. As such, issues and criticisms related to the ASI are equally relevant to the ASI-R and ASI-3.

While originally developed to explain panic disorder, the ASI-R is now more typically used across the range of anxiety disorders and, indeed, Axis I disorders in general (Taylor et al., 2007). As such, the sixteen outpatients included in the present study presented with a variety of anxiety-related problems. Similarly, consistent with the considerable attention paid in the ASI literature to the question of uniformity of measurement across symptomatic and asymptomatic populations (Deacon, Abramowitz, Woods, & Tolin, 2003; Taylor et al., 2007), participants ranged across different stages of treatment. Participants responded to ASI items and items from another measure of vulnerability to anxiety, the Anxiety Attitude and Belief Scale (AABS; Brown, Craske, Rassovsky, Tata, & Tsao, 2000), a scale developed with the aim of indexing beliefs independent of affect. A cognitive interviewing procedure was used, and the resulting verbal protocols were coded according to the apparent cognitive processes respondents engaged in when answering the items. The information provided permitted a direct test of the central assumption underlying the validity of the ASI, namely that it is a measure of beliefs rather than predominantly a measure of intensity and frequency of prior anxiety experiences. The methodology also permitted a more general examination of whether participants were responding as intended to the ASI instructions.

1. Method

1.1. Participants

The 16 participants (10 females, 6 males) were patients of an adult psychology outpatient department and were included if their primary presenting problem was anxiety. ICD-10 diagnostic classifications given by their clinician were: agoraphobia without panic disorder ($N = 1$), agoraphobia with panic disorder ($N = 2$), social phobia ($N = 4$), other anxiety disorder ($N = 3$), panic disorder ($N = 4$), generalized anxiety disorder ($N = 1$), and obsessive compulsive disorder ($N = 1$). Participants were interviewed after assessment ($N = 7$), or during ($N = 4$) or after ($N = 5$) individual or group treatment. The sample was mostly White ($N = 12$) with one Black participant and three declining to state their ethnicity. Mean age was 37.5 (SD = 12.8, range = 21–64 years). Potential participants were excluded if their English was not fluent or if they had cognitive deficits (head injury or learning disability). Participation was voluntary. Participants were not compensated, although travel expenses were reimbursed.

1.2. Measures

1.2.1. Anxiety Sensitivity Index-Revised (ASI-R)

According to Reiss's expectancy theory, anxiety sensitivity (AS) is the "fear of fear," said to arise from the belief that the experience of anxiety has negative consequences, including illness, embarrassment or additional anxiety (Reiss, 1991). The Anxiety Sensitivity Index aims to index such beliefs. AS is supposed to amplify fear and anxiety reactions, playing a role in the etiology and maintenance of anxiety disorders, especially panic disorder and agoraphobia. The large body of research using the ASI has been extensively reviewed (Cox et al., 1999; McNally, 1999; Taylor, 1996). The ASI-R is an expanded Anxiety Sensitivity Index, consisting of 36 items. The respondent is asked to rate how

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