



Reliability and validity of the dimensional features of generalized anxiety disorder[☆]



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ABSTRACT

The reliability and validity of the dimensional features of generalized anxiety disorder (GAD) were examined in a diverse sample of 508 outpatients with anxiety and mood disorders who underwent two independent administrations of the Anxiety Disorders Interview Schedule for *DSM-IV*: Lifetime version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994). Inter-rater reliability was higher in the full sample than in patients with current GAD. Additionally, the presence of a mood disorder weakened inter-rater reliability. We also explored the unique contribution of excessiveness and uncontrollability of worry to various clinical outcomes and found that excessiveness predicted anxiety, depression, and stress self-report measures, and uncontrollability predicted clinical severity and number of diagnoses. Findings are discussed with regard to their implications for the classification of GAD (e.g., utility of dimension-based assessment to improve the classification of psychological disorders).

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Classification of anxiety and mood disorders has been an inexact science, reflected by the modest reliability of many diagnostic categories (e.g., Brown, Di Nardo, Lehman, & Campbell, 2001). Generalized anxiety disorder (GAD) is a diagnostic category that has undergone substantial revisions (Brown, Barlow, & Liebowitz, 1994). GAD is classified in the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* (American Psychiatric Association, 2013) as chronic (lasting at least six months), excessive anxiety and worry about a number of events or activities that is difficult to control, and is associated with at least three of six symptoms of tension/negative affect with some present more days than not for at least six months. For GAD to be assigned, the worries and associated symptoms must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. Additionally, a diagnosis of GAD requires that the anxiety and worry do not occur exclusively during the course of a mood or psychotic disorder.

When GAD first appeared in *DSM-III* (American Psychiatric Association, 1980), it was a residual category, diagnosed only if a patient did not meet criteria for any other anxiety or mood

disorder. This definition was associated with low inter-rater reliability ($\kappa = .47$; Di Nardo, O'Brien, Barlow, Waddell, & Blanchard, 1983). The reformulation of GAD in *DSM-III-R* (American Psychiatric Association, 1987) failed to considerably improve the reliability of the disorder, as was shown by large-scale studies entailing administration of two independent structured interviews (κ s for current GAD were .27 in Mannuzza, Fyer, Martin, & Gallops, 1989; .53 in Di Nardo, Moras, Barlow, & Rapee, 1993; and .56 in Williams et al., 1992). Evidence of low reliability and high comorbidity of GAD with other disorders (comorbidity rates exceeding 80%; see Brown & Barlow, 1992) led researchers to question whether there was sufficient discriminant validity to retain GAD as a diagnostic category in *DSM-IV* (Brown et al., 1994). The diagnostic criteria were revised substantially in *DSM-IV* (American Psychiatric Association, 1994) in an effort to define the boundary of GAD with other anxiety disorders, mood disorders, adjustment disorders, and nonpathological worry. Revisions to *DSM-IV* included the requirement that worry must be perceived as uncontrollable (based on evidence that uncontrollability of worry distinguishes GAD worry from normal worry; Abel & Borkovec, 1995; Borkovec & Roemer, 1994).

Another substantial change in *DSM-IV* was the reduction of associated symptoms from 18 to 6. Symptoms of autonomic arousal (e.g., accelerated heart rate, shortness of breath) were eliminated, while symptoms of tension and negative affect (e.g., muscle tension, irritability) were retained. Although this change was partly data-driven (e.g., Brown, Marten, & Barlow, 1995), researchers were concerned that this revision would further obfuscate the boundary between GAD and mood disorders (Clark & Watson, 1991). Nonetheless, the revisions to *DSM-IV* GAD diagnostic criteria were

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associated with increased diagnostic reliability ($\kappa = .67$ in Brown et al., 2001), compared to *DSM-III-R* ($\kappa = .53$ in Di Nardo et al., 1993).

In addition to examining the diagnostic reliability of the various *DSM-IV* anxiety and mood disorders, Brown et al. (2001) evaluated the factors most commonly involved in diagnostic disagreements; e.g., difference in patient report, threshold disagreements (e.g., difficulties applying cutoffs for presence or absence of a disorder based on sufficient distress or impairment), change in clinical status, interviewer error, and diagnosis subsumed under comorbid condition. With regard to the diagnosis of GAD, difference in patient report was the most common source of disagreement (55%). A reliable diagnosis of GAD calls for consistent self-report of many subjective features, their onset, and their duration in relation to other conditions (e.g., mood disorders). Inconsistency in patient reports could be indicative of vagueness of these diagnostic features and patients' difficulty distinguishing them from other disorders (Brown et al., 2001). This study also found that GAD diagnostic disagreements involved mood disorders in 47% of cases, which is consistent with prior evidence that boundary issues with mood disorders pose a larger problem for GAD than do other anxiety disorders (e.g., Brown, Chorpita, & Barlow, 1998).

In addition to work on reliability at the diagnostic level, researchers have begun to explore the reliability of the dimensional features of GAD. Gordon and Heimberg (2011) examined the reliability of GAD features in a sample of 129 patients with a principal diagnosis of GAD. GAD features were assessed using the Anxiety Disorders Interview Schedule for *DSM-IV*: Lifetime version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994). As estimated by intraclass correlations (ICCs), the dimensions of excessiveness of worry, uncontrollability of worry, and interference due to worry were found to have fair to good inter-rater agreement (i.e., ICCs = .60, .59, and .62, respectively). Agreement was poor for distress due to worry (ICC = .30). Agreement for the associated symptoms ranged from poor to good (range of ICCs = .22–.65), and varied by symptom (i.e., good for fatigue, fair for irritability, muscle tension, sleep disturbance, and concentration difficulties, and poor for restlessness) (Gordon & Heimberg, 2011).

In addition, Gordon and Heimberg (2011) investigated the convergent and discriminant validity of dimensional features of GAD. Evidence for convergent validity of the clinical features of GAD with a questionnaire measure of pathological worry was somewhat modest. Specifically, although all correlations were statistically significant ($ps < .05$), the ADIS-IV-L rated dimensions of GAD were weakly correlated with the Penn State Worry Questionnaire (PSWQ); i.e., excessiveness ($r = .27$), uncontrollability ($r = .26$), distress due to worry ($r = .32$) and the clinical severity of GAD ($r = .20$). Moreover, some features of GAD evidenced poor discriminant validity with social anxiety (e.g., correlation of excessiveness of worry with Social Anxiety Interaction Scale = .46, $p < .001$). It is possible that reliability and concurrent validity estimates were attenuated by range restriction (i.e., less variability in measures of GAD and worry) because the sample was limited to outpatients with a principal diagnosis of GAD. In addition, Gordon and Heimberg (2011) did not assess disorders other than GAD and social phobia (i.e., the second interviewer did not administer the entire ADIS-IV-L), which may also have adversely impacted the reliability estimates. Administering solely the GAD and social phobia modules of the ADIS-IV-L may have resulted in symptoms being incorrectly attributed to GAD and social phobia, when the symptoms were actually due to another disorder that was not fully assessed, such as a mood disorder.

Another issue bearing on the validity of the dimensional features of GAD pertains to the distinctiveness of the diagnostic criteria of excessiveness and uncontrollability of worry. Some researchers (e.g., Andrews et al., 2010) have suggested that the excessiveness and uncontrollability criteria are redundant due to their

conceptual similarity and strong association (e.g., $r = .91$; Brown et al., 2001). Moreover, a study has shown that only about 4% of respondents who met criteria for GAD reported that their worries were excessive, but still controllable (Beesdo et al., 2011). Even though excessiveness and uncontrollability were retained as key, separate features for GAD in *DSM-5* (i.e., the criteria for GAD did not change between *DSM-IV* and *DSM-5*), the question remains about their discriminant validity. To examine the incremental validity of the uncontrollability criterion, Hallion and Ruscio (2013) recently conducted a study of 126 adults with GAD drawn from a community sample. Although the two features were intercorrelated highly ($r = .83$), it was found that uncontrollability incrementally added to the prediction of GAD and more general measures pertaining to clinical severity, comorbidity, and treatment-seeking after holding excessiveness constant. In most analyses, excessiveness was no longer a significant predictor after uncontrollability entered the model (Hallion & Ruscio, 2013).

The present study adds to previous work examining reliability and validity of GAD features (Gordon & Heimberg, 2011; Hallion & Ruscio, 2013), through the use of (a) a larger sample of outpatients who underwent two, independent administrations of the ADIS-IV-L, (b) double administrations of the complete ADIS-IV-L (not GAD and social phobia modules only as in Gordon & Heimberg, 2011), (c) second interviewers who were not cognizant of the first interviewer's ADIS-IV-L diagnoses, and (d) a more diverse clinical sample (i.e., the sample was not limited to GAD cases only). Because range restriction typically attenuates correlational estimates (e.g., reliability), we expected to find greater inter-rater reliability of GAD features in the full sample compared to GAD cases only. Furthermore, we evaluated four potentially salient moderators of inter-rater reliability: (1) days separating ADIS-IV-L assessments, (2) presence of a mood disorder, (3) number of diagnoses assigned, and (4) severity of worry (as indicated by the PSWQ scores). We predicted inter-rater reliability to decrease as the number of diagnoses increases, and we expected reliability to decrease as number of days between assessments increases. We predicted that the presence of a mood disorder would weaken reliability (due to well-known boundary issues between GAD and mood disorders described above). We also predicted that severity would impact reliability, with more severe GAD leading to higher reliability. Finally, we explored the question of whether both excessiveness and uncontrollability uniquely contribute to the prediction of overall GAD severity, number of diagnoses, negative affect, and depressive symptoms.

1. Method

1.1. Participants

Participants were 508 patients who presented for assessment and treatment at the Center for Anxiety and Related Disorders (CARD) at Boston University between March 1997 and August 2012. Individuals underwent a semi-structured interview and completed a series of self-report questionnaires at the time of their initial assessment. The sample was randomly selected from a larger sample to receive two independent administrations of the ADIS-IV-L. Women constituted a larger portion of the sample (59%). The average age was 31.82 ($SD = 10.32$, range 18–66). The sample was predominantly Caucasian (89%; African-American = 3%; Asian = 4%; Other = 4%). Participants were required to be age 18 or older and to have a presenting complaint involving anxiety or mood symptoms. Participants were excluded from the study if any of the following were present: (1) current delusions or hallucinations, (2) current suicidal or homicidal risk meriting intervention, or (3) two or more hospitalizations in the last 5 years for psychotic symptoms. Patients

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