



## Examining the latent structure of worry and generalized anxiety in a clinical sample<sup>☆</sup>



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### ABSTRACT

Generalized anxiety disorder (GAD) is characterized by “pathological” worry, suggesting that GAD worriers differ qualitatively from non-GAD worriers. However, results from taxometric studies of worry in undergraduate and community samples have been mixed and to date, no studies have utilized clinical samples. The current study examined the latent structure of worry and GAD symptoms in a diagnostically heterogeneous clinical sample. Indicators were selected from the Penn State Worry Questionnaire-Abbreviated ( $n = 1175$ ) and the GAD-7 ( $n = 638$ ) and submitted to three taxometric procedures: MAXCOV, MAMBAC, and L-Mode. Results from all three procedures suggested that both worry and generalized anxiety are best conceptualized as dimensional constructs. Findings also indicated that ongoing conceptualization, assessment, and treatment of worry and GAD may be hampered by the application of a categorical framework.

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Generalized anxiety disorder (GAD) is characterized by “pathological” worry, defined as uncontrollable and excessive, and at least three additional symptoms including fatigue, sleep difficulty, restlessness, irritability, difficulty concentrating, and muscle tension (American Psychiatric Association, 2013). Most major diagnostic classification schemes—including the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM 5; American Psychiatric Association, 2013)—define disorders categorically. Thus, GAD is conceptualized as a discrete disorder that is either present or absent and is assessed and treated accordingly. However, mounting empirical evidence supporting a dimensional latent structure of psychological disorders has yielded a call for shifting to a dimensional classification system (Brown & Barlow, 2009; Watson, 2005). Understanding the underlying structure of both worry and GAD symptoms directly affects conceptual

and etiological models, which differ based on a categorical or dimensional conceptualization. Because such models guide assessment and intervention strategies, there is a significant clinical need for accurate conceptualizations of the latent structure of GAD.

The unique association between worry and GAD is an area of considerable interest. Excessive worry is the defining characteristic of GAD, implying a categorical difference between “GAD worriers” and other “non-GAD worriers.” The distinction between worriers is complicated by increasing recognition of worry as a transdiagnostic construct with relevance to a number of disorders other than GAD (Harvey, Watkins, Mansell, & Shafraan, 2004; Starcevic et al., 2007). For example, Starcevic (1995) found that individuals with major depressive disorder (MDD) and GAD report comparable levels of worry. Further, other studies have found that excessive worry often fails to discriminate GAD from other disorders (Gladstone et al., 2005; Kertz, Bigda-Peyton, Rosmarin, & Björgvinsson, 2011; Mohlman et al., 2004). Thus, the extent to which there is a meaningful difference between worry within the context of a GAD diagnosis and worry outside the diagnosis is unclear.

A dimensional conceptualization of worry has been supported empirically by several taxometric studies. Ruscio, Borkovec, and Ruscio (2001) found preliminary support for an underlying dimensional structure using the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) in a large undergraduate sample. Results from a second study of two large nonclinical samples were also indicative of worry’s dimensional structure (Olatunji, Broman-Fulks, Bergman, Green, & Zlomke, 2009). Of note, Olatunji

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et al. (2009) included additional measures of GAD symptoms, intolerance of uncertainty, and beliefs about worry as well as the PSWQ, suggesting that GAD itself may fall along a continuum. Furthermore, intolerance of uncertainty, which is often linked with GAD, also appears to have dimensional structure (Carleton et al., 2012). Moreover, findings that high worriers with and without GAD share many similarities (Ruscio, 2002) provide additional evidence for a dimensional conceptualization of GAD.

Not all studies have supported the dimensional conceptualization of worry, however. Schmidt et al. (2009) initially found a categorical structure of worry using the PSWQ in a sample of undergraduates. The authors then replicated this finding in a second independent sample of individuals from the community. Of note, the authors reported some methodological concerns with low indicator validity and a very high estimated base rate for the hypothesized worry group (40%), which is much greater than expected based on GAD prevalence rates. Given the inconsistent findings regarding the latent structure of GAD and worry, further study is warranted.

Although previous studies have been informative, they have been limited by the use of non-clinical samples. Replicating the finding that worry and GAD are dimensional constructs in clinical samples would provide additional evidence for the generalizability of the results. Furthermore, given the burgeoning literature implicating worry as a transdiagnostic symptom not limited to GAD, taxometric studies are needed to determine if a pathological worry group (putative GAD group) can be distinguished from psychiatric disorders that are also associated with pathological worry but do not meet full criteria for GAD.

The current study was designed to build upon previous studies investigating the underlying structure of worry and symptoms of GAD. This study fills important gaps in the literature by examining a diagnostically heterogeneous clinical sample of patients. We used two measures: the PSWQ-Abbreviated (Hopko et al., 2003) and the Generalized Anxiety Disorder Scale-7 (Spitzer, Kroenke, Williams, & Lowe, 2006). Based on previous taxometric studies of worry, we hypothesized that both worry and generalized anxiety would have a dimensional underlying structure.

## 1. Methods

### 1.1. Participants

The study sample consisted of 1175 adult patients presenting for treatment at the Behavioral Health Partial Program (BHPP) at McLean Hospital between July 2010 and July 2012. The BHPP is a cognitive behavioral therapy based day treatment program designed to use both individual and group therapy as treatment for individuals experiencing mood and/or anxiety disorders. All participants completed the Penn State Worry Questionnaire-Abbreviated (Hopko et al., 2003;  $N = 1175$ ). Due to modifications of the larger study protocol, only a subsample of patients completed the GAD-7 ( $n = 638$ ). The final sample was mostly female (56%), and the mean age was 35 years ( $SD = 13.7$ ). Most participants had never married (58%) while 25% were married, 13% divorced, 3% living with their partner, and 1% widowed. Most participants (85%) were White, with 4% Asian, 2% Latino/a, 2% Black/African American, fewer than 1% Native Hawaiian/Pacific Islander or American Indian/Alaskan Native, and 3% multiracial (3% chose not to respond). With regard to education, 31% completed high school, 17% some college, 23% 4-year college, 28% post-graduate education, and 1% some high school. The most common diagnosis was Major Depressive Disorder (53%), followed by GAD (34%), Social Anxiety Disorder

(20%), Panic disorder (11%), Post-Traumatic Stress Disorder (11%), Obsessive-Compulsive Disorder (11%), Bipolar Disorder (10%), and a Psychotic Disorder (6%).

### 1.2. Measures

*Penn State Worry Questionnaire-Abbreviated* (PSWQ-A; Hopko et al., 2003). The PSWQ-A is an eight-item instrument derived from the full length 16-item PSWQ (Meyer et al., 1990) that measures worry frequency and severity. Items on the PSWQ-A (e.g. “Many situations make me worry”) are scored on a 5-point Likert scale ranging from 1 (*not at all typical*) to 5 (*very typical*). The PSWQ-A has shown good construct validity ( $r = .65-.83$ ) in relation to the PSWQ and has demonstrated moderate to strong reliability and validity in older and younger adults (Crittendon & Hopko, 2006). In the current sample the PSWQ-A scores demonstrated excellent internal consistency in participants with current GAD ( $\alpha = .92$ ) and without GAD ( $\alpha = .94$ ).

*The 7-item Generalized Anxiety Disorder Scale* (GAD-7; Spitzer et al., 2006). The GAD-7 is a brief seven-item self-report instrument developed to assess/screen for GAD. Items on the GAD-7 (e.g. “Feeling nervous, anxious or on edge”) are scored on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly everyday*). The GAD-7 has demonstrated good construct validity and reliability; higher severity scores on the GAD-7 are strongly correlated with greater impairment/worsening functioning as seen with the SF-20 Health-Related Quality of Life Scales (Spitzer et al., 2006). The GAD-7 scores demonstrated strong internal consistency in participants with GAD ( $\alpha = .85$ ) and without GAD ( $\alpha = .89$ ) in the current sample.

*Mini-International Neuropsychiatric Interview* (MINI; Sheehan et al., 1998). The MINI is a semi-structured diagnostic interview developed to screen for 17 Axis I DSM-III-R disorders. The MINI has shown to have strong reliability and validity in regards to the Structured Clinical Interview for DSM-IV (SCID-IV) with inter-rater reliabilities ranging from kappas of .89–1.0 (Sheehan et al., 1998). In the current study, the MINI was administered by doctoral practicum and intern-level students studying clinical psychology. All interviewers were trained and supervised by a postdoctoral psychology fellow on a weekly basis prior to administering any interviews for the program.

### 1.3. Procedure

The McLean Hospital Institutional Review Board approved the current study. All participants provided informed consent and were treated in accordance with the ethical guidelines provided by the American Psychological Association. Participants completed an initial assessment pre-treatment including a demographics survey, a battery of self-report measures and a structured diagnostic interview (MINI). The battery of self-report measures was also completed on discharge.

### 1.4. Data analytic plan

Descriptive statistics were estimated using SPSS 21.0. Taxometric analyses and comparison data simulations were conducted using Ruscio's (2011) suite of programs for R. We used Maximum Covariance (MAXCOV), Mean Above Minus Below a Cut (MAMBAC), and latent-mode factor analysis (L-Mode; Waller & Meehl, 1998) procedures, which provide non-redundant results.

*Indicator selection.* The PSWQ is considered the “gold standard” worry assessment tool and the eight item abbreviated version has also demonstrated strong psychometric properties (Crittendon & Hopko, 2006). Using all items as indicators, preliminary

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