

Perceptions of Functioning in Worry and Generalized Anxiety Disorder

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Abstract Research has suggested that individuals with generalized anxiety disorder (GAD) may underestimate the quality of their cognitive and interpersonal functioning, raising the question of whether perceived impairments are widespread across life domains and distinguish GAD from other forms of severe worry. The present study addressed these questions by examining perceived and actual (grade point average and interviewer-rated) impairments in GAD worriers, non-GAD high worriers, and normal worriers. Elevated performance standards were examined as an explanation for perceived impairments. Participants were assigned to groups based on diagnostic interview and measures of worry. They completed measures of perceived functioning and performance standards. Both groups of worriers reported widespread impairments and preliminary evidence suggestive of elevated performance standards. Results suggest that both GAD and non-GAD worriers perceive themselves to be impaired across important life domains. However, grade point average does not show evidence of impairments and some amount of the

impairment reported by both high worry groups may reflect elevated performance standards.

Keywords Worry · Generalized anxiety disorder · Impairment · Life satisfaction

Introduction

Generalized anxiety disorder (GAD) is a psychological condition characterized by excessive and uncontrollable worry about a number of life events or activities. Worry in GAD is accompanied by symptoms of restlessness, fatigue, difficulty concentrating, irritability, muscle tension, and sleep disturbance. By definition, individuals diagnosed with GAD report significant distress or impairment related to their symptoms (American Psychiatric Association 1994). Studies have found GAD to be associated with significant psychosocial and functional impairment (Wittchen et al. 1994) and with increased health care utilization (Greenberg et al. 1999). Importantly, individuals with GAD report poorer overall quality of life compared not only to nonanxious individuals (Henning et al. 2007) but to individuals with other anxiety and mood disorders (Hoffman et al. 2008), suggesting that this disorder may be particularly debilitating. In fact, GAD has been found to be associated with more occupational disability (in terms of days out of role) than any other single mental disorder (Kessler and Wittchen 2002).

Despite numerous studies linking GAD with significant personal disability and societal cost, recent findings have begun to question whether some of the impairments reported by those with GAD may be due, at least in part, to these individuals' misperceptions of the quality of their functioning. For example, GAD worriers report low

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confidence in their cognitive abilities, including attention, memory, and cognitive flexibility (Ruscio and Borkovec 2004). By contrast, neuropsychological research has shown their performance on objective tests of cognitive functioning to fall within normal limits and to be comparable to the performance of nonanxious controls (Aikins and Craske 2001). GAD worriers also rate themselves as having more interpersonal problems and being less interpersonally effective than do normal worriers (Borkovec et al. 2002; Przeworski et al. 2011). However, in one study in which collateral ratings were obtained from friends, GAD worriers and normal worriers received similar ratings of interpersonal functioning (Eng and Heimberg 2006). Taken together, these studies suggest that individuals with GAD may perceive deficiencies that are not apparent to others or reflected in objective measures.

Several important gaps in knowledge presently limit understanding of functional impairment in GAD. First, previous studies of GAD have either assessed functioning globally or examined functioning in a small subset of life domains. There is a need to determine whether self-reported deficits in functioning extend to important life domains not studied previously (e.g., educational achievement, family relationships). Second, understanding the reasons for these perceived impairments will be important in designing appropriate interventions to improve the quality of life of individuals who suffer from GAD. Perfectionism is strongly associated with worry and GAD and may lead affected individuals to hold themselves to extremely high standards (Kawamura et al. 2001; Stober and Joormann 2001). Elevated standards for what constitutes adequate functioning may in turn lead worriers to evaluate themselves more poorly than individuals with lower standards, even if actual functioning is the same. This possibility has not been tested directly by previous studies, whose methods have been limited to self-report assessment of perfectionism and functioning. Because GAD worriers may have genuinely worse life situations than normal worriers, such methods cannot ascertain whether negative appraisals of functioning reflect poor quality of life or misappraisals (due to elevated performance standards) of what others might consider good functioning. Researchers have overcome the issues that arise when different groups of respondents (e.g., from different countries or socioeconomic groups) hold different standards for endorsement of response categories by using ratings of a standardized vignette (King et al. 2004) to calibrate participants' ratings across a common set of life circumstances. This methodology has not previously been used in studies of symptom-related impairment and may provide valuable information beyond that obtained from global self-report measures of perfectionism by allowing for direct examination of between-group differences in performance standards across important and relevant life domains. If these ratings

show evidence of elevated standards in worriers, particularly if these elevated standards occur in the absence of genuine functional impairments, then treatment may need to focus on modifying elevated standards rather than improving functioning.

Finally, the tendency of prior studies to compare GAD worriers with normal worriers has made it difficult to disentangle whether self-reported impairment covaries with GAD status or with worry severity more generally. Recent research has revealed that many individuals who report high levels of worry do not qualify for a diagnosis of GAD (Kessler et al. 2005; Ruscio 2002). A rigorous test of perceived impairments that are unique to GAD requires a demonstration that these features are found in GAD but not in similarly worried individuals without the disorder. By contrast, if features previously attributed to GAD are also found among non-GAD high worriers, it may suggest that efforts to reduce the disability associated with anxiety, and perhaps prevent the onset of full-blown GAD, may need to include even nondiagnosed severe worriers.

Of the few studies that have compared GAD and non-GAD high worriers, we are aware of only one that has compared these groups on a functional domain not directly related to symptoms of the disorder (Ruscio and Seitchik 2007). In this study, GAD and non-GAD high worriers performed comparably to one another, and to normal worriers, on an interpersonal problem-solving task. Nonetheless, both groups of high worriers were less satisfied with their problem-solving performance than were the normal worriers. Both groups of high worriers also reported more negative self-appraisals than normal worriers on global self-report questionnaires assessing problem-solving skill, satisfaction with problem-solving skill, and problem-solving confidence. These results are consistent with prior findings of subjective rather than objective impairment in GAD (Aikins and Craske 2001; Eng and Heimberg 2006) and raise the possibility that severe worriers, irrespective of GAD status, may underestimate their functioning in ways that serve to perpetuate worry.

The current study had three objectives aimed at addressing existing gaps in this literature. The first objective was to compare GAD worriers, non-GAD high worriers, and normal worriers on measures of distress and impairment. GAD worriers were expected to self-report more distress and impairment relative to non-GAD high worriers, who in turn were expected to report more than normal worriers. However, both groups of high worriers were expected to overestimate their level of impairment relative to that seen on more objective indicators (i.e., grade point average, interviewer-ratings) and to show a higher level of distress than impairment. The second objective was to test whether GAD worriers, non-GAD high worriers, and normal worriers differ in their perceived

functioning in important life domains, and to explore whether this effect is evident across life domains or confined to specific areas of functioning. GAD worriers were expected to rate their functioning across important life domains more poorly than non-GAD high worriers, who in turn were expected to rate themselves more poorly than normal worriers. The third objective was to test the extent to which differences in perceived functioning may reflect differing personal standards for what qualifies as adequate functioning using a standardized rating task and a global self-report measure of perfectionism. GAD worriers were expected to hold elevated personal standards relative to non-GAD high worriers, who in turn were expected to hold elevated standards relative to normal worriers.

Methods

Design

Participants were selected for inclusion in the three study groups (GAD worry, non-GAD high worry, and normal worry) on the basis of the Penn State Worry Questionnaire (PSWQ; Meyer et al. 1990) and the Anxiety Disorders Interview Schedule (ADIS; DiNardo et al. 1994). Participants in the GAD group ($N = 25$) were diagnosed with *DSM-IV* GAD using the ADIS. Participants in the non-GAD high worry group ($N = 46$) did not qualify for a GAD diagnosis on the ADIS, but scored within one standard deviation of the published PSWQ mean for GAD patients ($PSWQ \geq 56$; Molina and Borkovec 1994). Importantly, the PSWQ scores of the GAD ($M = 68.04$, $SD = 7.91$) and non-GAD high worry ($M = 66.35$, $SD = 5.86$) groups were quite similar in the current sample, $t(69) = 1.01$, $p = .318$, $d = 0.24$, suggesting that any differences in perceived functioning between these groups could not be attributed to differences in worry severity. The most common reasons that participants in the non-GAD high worry group did not meet diagnostic criteria for GAD were (a) that they did not endorse at least three associated symptoms more days than not over a 6 month period, and (b) that they did not endorse worry about more than one topic or across more than one life domain. Participants in the normal worry group ($N = 37$) did not qualify for a GAD diagnosis and scored within one standard deviation of the PSWQ mean for healthy college students ($PSWQ \leq 50$; Molina and Borkovec 1994). The PSWQ score in the normal worry group ($M = 38.86$, $SD = 8.14$) was significantly lower than that reported by the two high worry groups, both $t > 14.24$, both $p < .001$.

Participants in the two high worry groups were not excluded from the study if they reported secondary diagnoses, as long as they reported that worry/GAD symptoms were their principal concern at the current time. In the GAD group, six participants

(24 %) reported secondary diagnoses including chronic pain ($n = 1$), depression ($n = 2$), social anxiety ($n = 1$), OCD ($n = 1$), and PTSD ($n = 1$). In the non-GAD high worry group, three participants (6 %) reported diagnoses including eating disorders ($n = 1$) and depression ($n = 2$). No participants in either group reported past diagnoses. Sixteen participants in the non-GAD high worry group reported clinically significant distress or impairment (despite not meeting full criteria for GAD) and would therefore meet criteria for Anxiety Disorder NOS. No participants in the normal worry group reported past or current psychiatric diagnoses.

Participants

A power analysis was conducted using effect sizes from prior research comparing GAD and non-GAD high worriers on self-reported impairment and quality of life. Effect sizes were in the moderate to large range ($d = 0.31$ – 1.90 ; Gentes and Ruscio 2008). The mean of these effect sizes ($d = 1.10$) was submitted to the power analysis, which indicated that a power level of 0.80 (with $\alpha = 0.05$) would be achieved with 23 participants per group.

The sample consisted of undergraduate students at a private northeastern university. Participants were primarily female (66 %; $N = 71$) with a mean age of 19 ($SD = 1.12$). Sex composition ($\chi^2(2, N = 108) = 5.08$, $p = .080$) and age ($F(2, 108) = 1.34$, $p = .266$) did not differ significantly across groups. The sample was 64 % Caucasian, 18 % Asian/Pacific Islander, 7 % Hispanic, 5 % Black, and 6 % other race–ethnicity. Race–ethnicity did not differ significantly across groups, $\chi^2(2, N = 108) = 5.68$, $p = .456$.

Measures

Grouping Measures

The PSWQ (Meyer et al. 1990), was completed online as part of a larger screening that included self-report measures of personality and psychopathology. The PSWQ is a 16-item self-report measure of worry. Participants are asked to rate each item on a 5-point Likert scale and item responses are summed to form a total score ranging from 16 to 80. The measure has been shown to have excellent psychometric properties in student, community, and clinical samples (c. f. Molina and Borkovec 1994; van Rijsoort et al. 1999). Cronbach's alpha was 0.72 in the current sample. Participants for the GAD and non-GAD high worry groups were recruited on the basis of high scores on the PSWQ (within one standard deviation of the published mean for GAD patients; Molina and Borkovec 1994), in order to ensure sufficient sample size for these high worry groups.

Participants were administered the GAD module of the Anxiety Disorders Interview Schedule (ADIS; DiNardo

et al. 1994), a semi-structured clinical interview assessing the *DSM-IV* symptoms of GAD. The ADIS was administered in-person by either the first author or one of two trained research assistants. All assessments were audiotaped and reviewed by the first author. Based on review of all 108 tapes, the three assessors achieved perfect agreement ($\kappa = 1.00$) for GAD diagnostic status.

In addition to GAD diagnostic status, interviewers provided ratings of distress and interference related to worry on a scale from 0 (*none*) to 8 (*very severe*). These ratings were based in part on participants' self-reported distress and interference (rated on the same scale), but also took into consideration the interviewer's assessment based on information provided during the interview. As such, these ratings served as a more objective measure of distress and interference than self-report measures. Inter-rater reliability for distress and interference due to worry was assessed using intraclass correlation coefficients and was good to fair ($r = .62$ and $.50$ for distress and interference, respectively), which is consistent with results from previous studies (Gordon and Heimberg 2011).

Finally, in order to test the hypothesis of a greater discrepancy between distress and interference in non-GAD compared to GAD worriers, a distress-to-interference ratio was created by dividing each participant's ADIS distress rating by his or her interference rating such that a higher ratio indicated more distress relative to the level of impairment.

Measures of Distress and Impairment

Participants completed the Sheehan Disability Scale (SDS), which assesses self-reported impairment due to symptoms. It is comprised of three items assessing impairment in the domains of work/school, social, and family/home life on an 11-point Likert-type scale ranging from 0 (*not at all*) to 10 (*extremely*). It also asks participants to provide a count of the number of days lost and number of days unproductive over the past week due to symptoms. Because participants in the current study were not expected to endorse high levels of impairment, the scale was modified to measure number of days lost and number of days unproductive over the past month rather than the past week. The SDS has been found to be internally consistent (Leon et al. 1997) and a sensitive measure of impairment for a broad constellation of disorders (Olfson et al. 1997). Cronbach's alpha was .78 in the current sample.

Participants also completed a demographics form that included questions about gender, race/ethnicity, age, current and past psychiatric diagnoses, and current and past psychotherapy or psychotropic medications for the treatment of any emotional or personal difficulties. This form was completed in self-report format prior to the

participant's laboratory session and was provided to the diagnostic interviewer administering the ADIS, who used it to confirm the accuracy and thoroughness of responses, and to obtain additional information related to history of psychiatric diagnoses and treatment.

Finally, participants were asked to provide permission for authors to access their cumulative grade point average (GPA), to serve as an objective measure of functioning. The possible range of GPA scores was from 0.0 (corresponding to an "F" average) to 4.0 (corresponding to an "A" average).

Measure of Perceived Functioning

Participants completed a Self-Ratings Questionnaire which was adapted for this study from the Quality of Life Enjoyment and Satisfaction Questionnaire (QLESQ), which measures enjoyment and satisfaction across various areas of daily functioning (Endicott et al. 1993). The original version of the QLESQ has been found to have excellent internal consistency ($\alpha = 0.86$) and to correlate significantly with measures of clinical efficacy in a sample diagnosed with GAD (Wyrwich et al. 2009). The Self-Ratings Questionnaire included the same 12 life domains as the QLESQ (schoolwork, social relationships, family relationships, overall well-being, physical health, mood, leisure activities, sexual functioning, household activities, living/housing situation, economic status, ability to function in daily life). However, rather than rating their enjoyment and satisfaction in each domain as in the original measure, participants were asked to rate how well they had been doing in each domain over the past month. Participants rated their functioning in each domain using the original rating scale of 0 (*very poor*) to 8 (*very good*). Cronbach's alpha was 0.88 in the current sample. The correlation between the Self-Ratings Questionnaire and the SDS in the current study was statistically significant, negative in direction, and large in magnitude ($r = -.58, p < .001$), providing support for the validity of this measure as an indicator of participants' perceived functional impairment.

Self-reported Perfectionism

Participants completed the Frost Multidimensional Perfectionism Scale (FMPS), a 35-item self-report scale measuring perfectionistic tendencies, which has been shown to have good reliability and validity (Frost et al. 1990). Only the total score was used in this study and Cronbach's alpha was 0.91.

Standardized Rating Task

Participants were presented with a short passage written in the second person (i.e., "imagine that you are..."), which

described the life of a fictional student (see “[Appendix](#)”). They were asked to rate this student using the same domains and rating scale that they had used on the Self-Ratings Questionnaire. This standardized rating task was designed to serve as a standardized rubric to calibrate participants’ ratings across a common set of life circumstances. By holding actual functioning constant, this task enabled us to test for group differences in appraisals after eliminating the potential confound of objective differences in functioning. It was based on the methodology of anchoring vignettes (King et al. 2004) which was developed to address problems that occur when different groups of respondents (e.g., from different countries or socioeconomic groups) use response categories differently or hold different standards for endorsement of response categories. Anchoring vignettes have been found to be an effective tool for correcting for such differences in previous research on health (King et al. 2004), work disability (Kapteyn et al. 2007), job satisfaction (Kristensen and Johansson 2008), and life satisfaction (Christensen et al. 2006). The passage written for the present study was modeled after anchoring vignettes from previous research on clean drinking water and health (King et al. 2004; Salomon et al. 2004). The passage included both positive and negative details about a fictional student’s life across each of the 12 domains included in the present study. Participants were asked to read the passage and make ratings as if the passage were describing their own life. Results from pilot testing showed that responses to the passage were highly correlated with the personal standards subscale of the FMPS (Frost et al. 1990), $r = .65$, $p < .001$, providing support for the validity of this passage as a measure of elevated standards.

Procedure

All procedures were in compliance with ethical and institutional guidelines and were approved by the Institutional Review Board. Students were recruited through the Psychology Department’s Research Participation Web site, where they clicked on a link to complete a consent form and online screening questionnaires, which included the demographics form, the PSWQ, the SDS, and the FMPS. Participants whose PSWQ scores met the inclusion criteria for one of the study groups were invited to the lab to complete the hour-long study protocol. Students received research credits towards their psychology course in exchange for participation.

Participants provided informed consent and were administered the ADIS by an experimenter. They then independently completed the Self-Ratings Questionnaire and the standardized rating task. All participants were debriefed before leaving the lab.

Results

Statistical Approach

Because the study included a large number of outcome variables (12 life domains) and possible group comparisons (GAD, non-GAD high worry, normal worry), two steps were taken to limit the number of statistical tests performed. First, four life domains (schoolwork, social relationships, family relationships, and overall well-being) were identified a priori as primary given their particular relevance for college students. The selection of primary life domains was based largely on a study examining the significance of different life domains for male and female college students (Blais et al. 1990). Consistent with expectations, this study found that schoolwork and social relationships were rated of highest importance to both male and female college students. Family relationships, in contrast, are arguably of less central importance to college students. However, this domain was included as primary based on the finding that family relationships were actually quite important to female students (who comprise the majority of the current sample). Finally, although leisure activities were found to be important to college students, this domain was not included as primary because of potential overlap with the domain of social relationships. The remaining eight life domains (physical health, mood, leisure activities, sexual functioning, household activities, living/housing situation, economic status, and ability to function in daily life) were considered secondary. Results for secondary domains were viewed as exploratory and interpreted with a focus on the overall pattern of group differences. Second, to conserve power for the comparisons of greatest interest, planned contrasts were used in place of omnibus tests. Planned contrasts are focused significance tests using the t statistic which conserve statistical power when specific patterns of results are predicted (Rosenthal and Rosnow 1985). Given our particular interest in identifying features unique to GAD relative to other forms of high worry, and to non-GAD high worry relative to more normative levels of worry, planned contrasts focused on these specific group comparisons.

Ratings of Distress, Impairment, and Global Perfectionism

Table 1 presents results for measures of distress and impairment. As expected, planned contrasts generally revealed higher levels of distress and impairment among GAD compared to non-GAD high worriers and among non-GAD high worriers compared to normal worriers. These differences were statistically significant on all self-report items, including disruption of schoolwork, social

Table 1 Indicators of distress, impairment, and treatment by group

Measure	Possible range	GAD (<i>n</i> = 25)	<i>d</i>	Non-GAD high worry (<i>n</i> = 46)	<i>d</i>	Normal worry (<i>n</i> = 37)
Distress/impairment ^a						
Disrupt schoolwork	1–10	6.68 (1.57)*	0.86	5.09 (2.09)	1.19	2.76 (1.82)*
Disrupt social life	1–10	5.84 (2.08)*	0.73	4.24 (2.32)	1.07	2.05 (1.73)*
Disrupt family/home life	1–10	4.52 (2.68)*	0.59	3.02 (2.43)	0.99	1.05 (1.43)*
Days lost ^b	0–30	2.20 (2.86)*	0.50	1.00 (1.85)	0.59	0.19 (0.62)*
Days unproductive ^b	0–30	9.04 (6.92)*	0.55	5.61 (5.55)	1.09	1.18 (1.51)*
ADIS distress	1–8	5.16 (0.75)*	0.66	4.46 (1.29)	1.42	2.78 (1.06)*
ADIS interference	1–8	4.48 (1.64)*	0.92	2.91 (1.76)	0.70	1.78 (1.44)*
ADIS distress/interference	–	1.24 (0.44)*	0.61	1.67 (0.90)	0.02	1.69 (0.88)
Grade point average	0–4.0	3.34 (0.48)	0.45	3.54 (0.41)	0.11	3.50 (0.29)
Treatment ^c						
Current psychotherapy	–	8 (32 %)	–	8 (17 %)	–	0 (0 %)*
Current medication	–	5 (20 %)	–	2 (4 %)	–	0 (0 %)
Past psychotherapy	–	15 (60 %)	–	15 (33 %)	–	7 (19 %)
Past medication	–	7 (28 %)	–	4 (9 %)	–	0 (0 %)

Values marked with an * differ from the value for the non-GAD high worry group at $p < .05$. Cohen's *d*s compare each group (GAD or normal worry) to the non-GAD high worry group

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^a Table values reflect means (standard deviations)

^b Rated over the past month

^c Table values reflect *n* (%)

life, and home/family life, number of days lost, and number of days unproductive, all $t(105) > 2.13$, all $p < .039$. The same pattern was seen for the interviewer-rated (ADIS) measures of distress and interference, with GAD worriers receiving higher distress and interference ratings than non-GAD high worriers, who in turn received higher ratings than normal worriers, all $t(105) > 2.90$, all $p < .002$.

Importantly, there were no significant differences in grade point average between any of the groups, all $t(105) < 1.73$, all $p < .091$, with all three groups maintaining uniformly high GPAs in the range of B+ to A–.

In order to test the hypothesis of a greater discrepancy between distress and interference among the groups of high worriers, the ratio of ADIS distress to interference was compared between the groups. A series of paired-samples *t* tests was also conducted to test for within-group differences in ratings of distress and interference. All groups reported significantly higher levels of distress than interference, all $t > 2.13$, all $p < .044$. The ratio of distress to interference was significantly lower in GAD than non-GAD worriers, $t(105) = 2.16$, $p = .033$, with no differences between non-GAD and normal worriers, $t(105) = 0.11$, $p = .912$, signifying a lower discrepancy between distress and interference in the GAD group, while the non-GAD high worriers reported a higher discrepancy that was more similar to that seen in normal worriers.

Measures of treatment receipt showed a similar pattern to other measures of distress and impairment with the non-GAD high worry group intermediate between the GAD worriers and normal worriers. However, most differences in receipt of treatment did not reach statistical significance. There were no significant differences between the GAD and non-GAD high worry groups in proportion of participants who reported current or past psychotherapy or medication, all $\chi^2(2, N = 71) < 5.59$, $p > .061$. A greater proportion of non-GAD high worriers compared to normal worriers reported current psychotherapy, $\chi^2(2, N = 83) = 7.12$, $p = .028$, but there were no differences between these groups in proportion receiving current medication or past psychotherapy or medication, all $\chi^2(2, N = 83) < 1.97$, all $p > .373$.

Ratings of Participants' Functioning

Primary Domains

Table 2 presents results for the four primary and eight secondary domains of functioning. As expected, planned contrasts revealed lower perceived functioning among GAD compared to non-GAD high worriers, and among non-GAD high worriers compared to normal worriers. Differences between GAD and non-GAD high worriers were statistically significant in the domains of schoolwork, social

Table 2 Group means and standard deviations for functioning by life domain

Domain	GAD (<i>n</i> = 25)	<i>d</i>	Non-GAD high worry (<i>n</i> = 46)	<i>d</i>	Normal worry (<i>n</i> = 37)
Primary domains					
Schoolwork	4.20 (1.89)*	0.75	5.50 (1.64)	0.16	5.76 (1.62)
Social relationships	4.72 (1.88)*	0.68	5.96 (1.76)	0.50	6.73 (1.12)*
Family relationships	5.96 (1.57)	0.36	6.61 (1.95)	0.25	7.03 (1.32)
Overall well-being	4.76 (1.45)*	0.74	5.74 (1.25)	0.99	6.88 (1.01)*
Secondary domains					
Physical health	4.96 (1.34)*	0.49	5.70 (1.58)	0.61	6.60 (1.34)*
Mood	4.56 (1.33)	0.41	5.12 (1.39)	0.92	6.35 (1.27)*
Leisure activities	5.64 (1.60)	0.24	6.04 (1.67)	0.48	6.70 (0.85)*
Sexual functioning	4.36 (1.60)*	0.86	5.79 (1.70)	0.36	6.38 (1.53)
Household activities	4.96 (2.15)	0.43	5.78 (1.76)	0.15	6.03 (1.42)
Living/housing situation	5.12 (2.01)	0.27	5.70 (2.06)	0.33	6.30 (1.63)
Economic status	5.40 (2.08)	0.38	6.11 (1.77)	0.02	6.08 (1.71)
Ability to function in daily life	5.56 (1.66)	0.45	6.24 (1.40)	1.02	7.41 (0.72)*

Table values reflect means (standard deviations). Means marked with an * differ from the mean for the non-GAD high worry group at $p < .05$. Cohen's *d*s compare each group (GAD or normal worry) to the non-GAD high worry group
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relationships, and overall well-being, all $t(105) > 2.70$, all $p < .010$. In contrast, there were no significant differences between GAD and non-GAD high worriers in the domain of family relationships, $t(105) = 1.53$, $p = .133$. Differences between non-GAD high worriers and normal worriers were statistically significant in the domains of social relationships and overall well-being, both $t(105) > 2.43$, both $p < .018$. There were no significant differences between non-GAD high worriers and normal worriers in self-ratings of schoolwork or family relationships, both $t(105) < 1.46$, both $p > .249$.

Secondary Domains

Self-ratings on secondary life domains also indicated lower perceived functioning among GAD compared to non-GAD high worriers and among non-GAD high worriers compared to normal worriers. GAD worriers rated themselves significantly more poorly than non-GAD high worriers on two of the eight secondary domains (physical health and sexual functioning), both $t(105) > 2.05$, both $p < .043$. Non-GAD high worriers rated themselves significantly more poorly than normal worriers on four of eight secondary domains (physical health, mood, leisure activities, ability to function in daily life), all $t(105) > 2.33$, all $p < .023$.

Ratings of a Standardized Passage

Primary Domains

To determine whether the previously observed group differences in self-rated functioning might be due to different personal standards for what constitutes good functioning,

we compared the groups on their ratings of a standardized passage describing the life of a fictional student (see Table 3). In an unexpected reversal of the pattern seen in self ratings, the non-GAD high worry group tended to rate the functioning of the fictional student more poorly than both the GAD and normal worry groups. Differences between the GAD and non-GAD high worry groups reached statistical significance only in the domain of schoolwork, $t(105) = 2.03$, $p = .045$. Differences between the non-GAD high worry and normal worry groups reached significance in the domains of social relationships and overall well-being, both $t(105) > 2.34$, $p < .021$, with additional trends towards significance in the domains of schoolwork and family relationships, both $t(105) > 1.75$, both $p < .083$.

Secondary Domains

The pattern was largely repeated for the secondary domains. No significant differences were found between GAD and non-GAD high worriers, all $t(105) < 1.75$, all $p > .083$. However, non-GAD high worriers rated the student in the passage more poorly than did normal worriers in four of the seven secondary domains (leisure activities, household activities, living/housing situation, ability to function in daily life), all $t(105) > 2.33$, all $p < .022$.

Self-reported Global Perfectionism

Non-GAD high worriers ($M = 95.95$, $SD = 14.46$) scored significantly higher than normal worriers ($M = 75.62$, $SD = 16.21$) on self-reported global perfectionism (FMPS), $t(105) = 5.80$, $p < .001$. There were no differences between

Table 3 Group means and standard deviations for passage ratings by life domain

Domain	GAD (<i>n</i> = 25)	<i>d</i>	Non-GAD high worry (<i>n</i> = 46)	<i>d</i>	Normal worry (<i>n</i> = 37)
Primary domains					
Schoolwork	5.48 (1.50)*	0.50	4.67 (1.73)	0.39	5.30 (1.49)
Social relationships	5.80 (1.12)	0.35	5.37 (1.34)	0.50	6.03 (1.28)*
Family relationships	5.28 (1.24)	0.19	5.02 (1.51)	0.38	5.57 (1.39)
Overall well-being	5.40 (0.87)	0.43	4.96 (1.17)	0.76	5.76 (0.93)*
Secondary domains					
Physical health	4.60 (1.76)	0.01	4.61 (1.64)	0.03	4.65 (1.51)
Mood	5.32 (1.46)	0.20	5.04 (1.32)	0.37	5.49 (1.12)
Leisure activities	5.60 (1.44)	0.43	5.02 (1.25)	0.61	5.81 (1.35)*
Household activities	3.04 (1.65)	0.33	3.63 (1.92)	0.52	4.51 (1.46)*
Living/housing situation	4.72 (1.40)	0.18	4.43 (1.85)	0.69	5.54 (1.30)*
Economic status	5.00 (1.29)	0.28	4.65 (1.23)	0.39	5.11 (1.13)
Ability to function in daily life	5.40 (1.32)	0.07	5.30 (1.35)	0.60	6.08 (1.23)*

Table values reflect means (standard deviations). Means marked with an * differ from the mean for the non-GAD high worry group at $p < .05$. Cohen's *d*s compare each group (GAD or normal worry) to the non-GAD high worry group
GAD generalized anxiety disorder

GAD ($M = 100.00$, $SD = 15.77$) and non-GAD high worriers, $t(105) = 1.02$, $p = .31$.

Discussion

Results from the present study show that both GAD and non-GAD high worriers perceive themselves to be impaired across important domains of functioning. On self-rated measures, a clear pattern emerged with GAD worriers reporting the highest levels of impairment and the lowest performance across important life domains, followed by non-GAD high worriers, and then by normal worriers. Importantly, a similar pattern of results was found for interviewer-rated distress and interference.

Findings with regards to the level of distress and impairment reported by GAD relative to non-GAD high worriers are consistent with findings from past research (Eng and Heimberg 2006; Henning et al. 2007; Hoffman et al. 2008; Ruscio 2002; Wittchen et al. 1994), and are unsurprising given that a diagnosis of GAD (and inclusion in the GAD group in the present study) required that these individuals report interference with functioning. However, with the exception of one recent study, which found that non-GAD high worriers—along with GAD worriers—reported impairment in the area of interpersonal problem solving (Ruscio and Seitchik 2007), much less attention has been paid to the experience of non-GAD high worriers relative to normal worriers. Findings from the present study show reports of reduced functioning in this group relative to normal worriers, not only on general measures of impairment (i.e., SDS), but also on specific domains of functioning (i.e., social relationships) and most importantly, on interviewer-rated measures (i.e., ADIS). However, results from the ADIS distress-to-impairment ratio

also suggest that the distress reported by this group of high worriers may be elevated relative to their impairment—and that they look more similar to normal worriers than to those with GAD in this respect. These findings expand upon previous research (e.g., Ruscio 2002) by comparing this non-clinical high worry group to normal worriers on both self- and interviewer-rated functioning, and across specific life domains.

Results from present study also build upon past research by suggesting an important potential explanation for the impairments reported by the high worry groups. Obtaining participants' ratings of a standardized passage enabled us to compare their reactions to a common set of life circumstances and consequently to detect differing personal standards for what qualifies as adequate functioning. In a reversal of the pattern seen for self-ratings (in which non-GAD high worriers rated their own functioning between that of GAD worriers and normal worriers), we found that non-GAD high worriers perceived the level of functioning described in the passage significantly more poorly compared to both GAD worriers (in the domain of schoolwork) and normal worriers (in the domains of social functioning and overall well-being). This finding is consistent with the possibility that non-GAD high worriers hold elevated standards for what constitutes adequate functioning, and may evaluate themselves according to these elevated standards.

Closer examination of the schoolwork domain also provides preliminary evidence for a role of elevated standards among GAD worriers. The domain of schoolwork serves as an ideal snapshot of the role of elevated standards, both because it is arguably the most important life domain to college students (Blais et al. 1990) and because a “true” objective measure is available in the form of cumulative GPA. Given that cumulative GPA among all

three groups was uniformly high and in the B+ to A– range, with no significant differences between groups, it is notable that the GAD group rated their own schoolwork significantly lower compared to the non-GAD high worry group. Further, the GPA described in the passage was very similar to (actually, very slightly lower than) the average GPA in the GAD group (3.30 in passage versus 3.34 in GAD group), yet within-group examination of self- and passage- ratings reveal that GAD worriers rated the schoolwork described in the passage in the “good range” and significantly higher than they rated their own schoolwork, which they placed in the “fair” range, $t(24) = 2.41$, $p = .024$.

These findings are consistent with past findings of a discrepancy between objective and perceived cognitive functioning among individuals with GAD (Aikins and Craske 2001; Ruscio and Borkovec 2004), and with findings from the global, self-reported measure of perfectionism in the current study, which showed high levels of perfectionism among both groups of high worriers relative to normal worriers. However, findings from the standardized rating task should be considered preliminary at this time because several alternative explanations may account for the pattern of findings in the present study. First, it is possible that in rating their own functioning, participants took into account not only their GPA, but also the level of disruption to their studies that was caused by their symptoms (i.e., in terms of missed classes or inability to concentrate). Further, although this task was designed to assess performance standards more objectively and participants were specifically instructed not to compare the passage to their own functioning, it may be that the instruction to imagine themselves in the vignette created a relative comparison with their own subjective functioning levels that skewed the ratings of the vignette. Future research could minimize this risk by removing the instruction for participants to imagine themselves in the passage or by using a passage written in the third rather than second person.

Results from the present study raise pointed questions about the relative importance of perceived versus genuine functioning. Research on stress (Lazarus and Folkman 1984) and social support (Barrera 1986), among other constructs, has shown perceived experience to be an important predictor of outcomes even when considered apart from objective indicators of experience (Cohen et al. 1993). The impairment perceived by both high worry groups in the present study—even if not based in objective impairment—may similarly be important in its own right, even contributing to the maintenance of worry and GAD. For instance, individuals who perceive themselves to have low ability and limited capacities may be more worried about their ability to deal successfully with possible future negative events and threats in the environment. They may

engage in increased worry in an attempt to anticipate and solve problems, avoid uncertainty about the future, or even superstitiously to prevent future negative events, thereby perpetuating the cycle of worry (Borkovec et al. 1994; Borkovec and Roemer 1995). It is impossible, in the present study, to determine the temporal order or causal relationship between high worry and elevated standards in the two high worry groups. Future research using a longitudinal design may lead to a better understanding of whether elevated standards operate as a risk factor for the development of high worry or are instead a consequence or epiphenomenon of that high worry.

Most individuals in the high worry group will not go on to develop GAD, but research shows that some individuals may move in and out of the diagnostic category over time (Ruscio et al. 2002). However, the present results show that even non-GAD high worry is associated with considerable distress and impairment. These findings are consistent with those from a recent study showing that increased levels of perseverative thought (e.g., worry) predicted more negative and sustained emotional response to a stressor (i.e., anxiety and depression; Ruscio et al. 2011). These findings highlight the relevance of worry, even outside of the GAD diagnosis, in contributing to the distress and impairment associated with normative life stressors (such as those described in the Standardized Rating Task), and suggest that worry may serve as a modifiable target for intervention (Querstret and Cropley 2013). Further, results from the present study show that individuals in both high worry groups are sufficiently distressed and impaired to seek treatment. However, the issues that they target in treatment differ between groups, with individuals in the GAD group tending report psychotherapy or medication for *DSM*-diagnosable anxiety and mood disorders while those in the non-GAD high worry group tended to report supportive therapy for life stressors or adjustment-related disorders (e.g., adjustment to college).

The present findings should be interpreted in the context of several limitations of the study. First, although participants met full *DSM-IV* criteria for GAD diagnosed by clinical interview, the use of a college student sample represents a limitation in that participants were relatively high functioning and consequently may not be representative of the broader population of individuals with GAD. In addition, certain life domains, such as economic status or household activities, may be less relevant to college students than to adults living independently in the community and so may be less likely to reflect impairment in this sample. Second, although the systematic assessment of functioning across a wide range of important life domains may be viewed as a strength of the study, the large number of resulting statistical tests increased the risk of Type I error. Consistent findings across domains increase confidence that

we are converging on real differences in functioning across these groups, but it is difficult to draw definitive conclusions where there are mixed findings across domains (as on the standardized passage rating task). Further confidence will require replicating positive findings in new samples, including community and clinical samples with GAD. Finally, the inability to corroborate participants' reports of impairment using objective measures of functioning is an additional limitation of the current study. Given the biases inherent in self-reports of functional impairment, corroboration is critical; however, many important life domains are difficult (e.g., leisure time activities) or perhaps even impossible (e.g., mood, overall well-being) to assess via objective measures. Future research will need to give careful consideration to how best to assess impairment and how complementary measures might be combined to provide a reasonable objective assessment of functioning. Useful measures might include external measures relevant to the population under study (e.g., measures of work performance for community participants), objective tests or performance tasks (e.g., the Means Ends Problem-Solving Task; Platt and Spivack 1975; cf. Ruscio and Seitchik 2007), and collateral ratings from others such as family, friends, coworkers, classmates, or supervisors.

The present study is notable for identifying widespread perceived and interviewer-rated impairment as common in both GAD and non-GAD high worriers, with preliminary evidence for elevated performance standards as a possible explanation for this perceived impairment.

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Conflict of Interest Emily L. Gentes and Ayelet Meron Ruscio declare that they have no conflicts of interest.

Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

Animal Rights No animal studies were carried out by the authors for this article.

Appendix

Imagine that you are in your third year as a student at the [large Northeastern University]. You are living off-campus with two roommates who you are friendly with. You all

get along well. There is some tension about household chores. You occasionally have mice in the kitchen because you allow dishes and trash to pile up when none of you feels like taking care of it. Your living situation is generally comfortable. Your neighborhood is noisy most nights and you are a light sleeper. You are awakened by street noise or parties at least a few times each week, but you are able to fall back to sleep within 30 min each time and rarely feel tired during the day. You spend two or three nights per week with your boyfriend/girlfriend, when he/she is not out with friends. You both enjoy having sex a few times per week, but about one night per week you don't feel like it and then you just tell him/her that you are not in the mood. You enjoy cooking or watching movies at home either alone or with your roommates and you occasionally tag along with them when they go out on the weekends.

You love and appreciate your family very much and spend at least a couple of days with them each time you have a school break, but you have arguments almost every time you get together with them. Your parents pay your tuition and rent and give you spending money. You know that your parents' jobs aren't going as well as they used to because of the trouble with the economy. Even with your part time job, you find that money is a little tight. By the time you have taken care of all of your necessary expenses you usually have a little money left over to use on something fun.

You are generally a very quick learner and you have maintained a GPA of 3.3. You occasionally become absentminded, losing your keys, forgetting things at home, and having trouble concentrating or learning the rules of simple games that your friends play in bars. Every day after classes you work out for 30 min at the gym. You avoid any strenuous activities or sports because you feel very out of shape when you run. You generally enjoy your daily activities. You occasionally feel down for a day or two and lose interest. On these days, you are able to carry on with your day-to-day activities, but everything you do feels like an effort. These feelings usually pass within a few days. You are generally very productive. You have also been getting a terrible headache about once a month that is relieved within 3–4 h of taking a painkiller. During the headache, you have to lie down and cannot take care of any other tasks.

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