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Experience and appraisal of worry among high worriers with and without generalized anxiety disorder

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Abstract

Recent research has revealed that a large number of highly worried individuals do not qualify for a diagnosis of generalized anxiety disorder (GAD). This raises the intriguing question of why some high worriers are more impaired and distressed by their worrying than others, particularly when the severity of their worry is the same. The present investigation sought to address this question by examining whether GAD and non-GAD high worriers differ in their actual worry experiences, their subjective appraisals of worry experiences, or both experiences and appraisals of worry. GAD and non-GAD worriers, selected for matching levels of trait worry severity, completed an attention-focus task with thought sampling before and after a brief worry induction. They also completed questionnaires assessing their experiences during and after the worry induction, as well as their general beliefs about worry. GAD worriers experienced less control over negative intrusive thoughts immediately after worrying, reported greater somatic hyperarousal following worry, and endorsed several negative beliefs about worry more strongly than their worry-matched controls. Results suggest that GAD is associated with unique experiences and appraisals that distinguish it from other forms of severe worry.

Keywords: Worry; Generalized anxiety disorder; Anxiety; Metacognition; Control; Attention

Generalized anxiety disorder (GAD) is a psychological condition whose defining characteristic and sole unique feature is chronic, excessive, uncontrollable worry (American Psychiatric Association, 1994). However, most individuals who report high levels of worry do not qualify

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for a diagnosis of GAD (Ruscio, 2002). Non-GAD high worriers (whose trait worry scores fall within one standard deviation of GAD worriers) report many of the symptoms of GAD, but view their worry as more controllable, less distressing and impairing, and less frequently associated with cognitive and physiological symptoms than do worriers diagnosed with GAD (Ruscio, 2002). These findings suggest that many individuals experience the high levels of trait worry normally associated with GAD, yet exhibit a different symptom picture than the one traditionally associated with this disorder.

Though these results raise intriguing questions about the relationship between worry and GAD, they have at least two significant limitations: they are based on global, retrospective self-reports that may or may not correspond to actual worry experiences, and they do not address why some high worriers suffer from considerable symptoms related to their worrying, while others do not. Thus, research is needed to more directly assess the worry experiences of GAD and non-GAD high worriers and to explore possible mechanisms that may underlie observed differences between these groups.

Research comparing the two worry groups has revealed that one of their largest and most consistent differences lies in the greater tendency of GAD-diagnosed individuals to perceive their worrying as distressing and impairing—that is, to regard worry as problematic (Ruscio, 2002). This suggests that worriers' subjective appraisals of their own worry process and general beliefs about worry may be a promising area in which to begin the search for mechanisms of group differences. Indeed, Wells (1995; Wells & Carter, 1999) has proposed a metacognitive model of GAD in which specific subjective factors are hypothesized to play a central role in the development of GAD. According to this model, GAD worriers are unique in their tendency to "worry about worry"—that is, to believe that the act of worrying is somehow negative or harmful. The subjective appraisal of worry as detrimental may lead to greater distress about worrying, increased attempts (and failures) to control worry, and heightened sensitivity to the physical and cognitive impairment with which worry is associated, thereby increasing symptom reporting and the likelihood of a GAD diagnosis.

Although this metacognitive model is compelling, its ability to account for differences between GAD and non-GAD high worriers is uncertain. Because studies have tended to compare GAD worriers with minimally-worried individuals, it is unclear whether negative metacognitive appraisal of worry is truly specific to GAD or more generally associated with high levels of worry. Moreover, because GAD high worriers tend to report more severe symptoms than non-diagnosed high worriers, it is unclear whether group differences in distress and impairment stem solely from different beliefs about worry or also from differences in actual worry experiences. In other words, while divergent beliefs about worry may cause similar worry experiences to be interpreted as differently problematic by the two groups, it is possible that the worry of GAD worriers really *is* more problematic than that of non-GAD high worriers.

Consider, for example, the controllability of worry. If (as their ratings suggest) GAD high worriers truly have less control over their worrying than do non-GAD high worriers, their worry is likely to cause greater disruption of important activities and, in turn, lead to greater impairment and distress than the more controllable worry of non-diagnosed individuals. By contrast, high worriers with and without GAD may have similar control over their worrying, but only those worriers who *perceive* their worry to be uncontrollable—and who believe that

uncontrolled thoughts may have dangerous and disastrous consequences—may be sufficiently distressed by their worrying to qualify for a GAD diagnosis.

The present study sought to determine whether GAD and non-GAD high worriers regard worry as differentially problematic because of actual differences in the way that they experience worry, because of differing beliefs about worry, or because of differences in both experiences and beliefs. To disentangle individuals' actual worry experiences from their appraisals of these experiences, we employed an attention-focusing task (cf. Borkovec, Robinson, Pruzinsky, & DePree, 1983) before and after an induced worry period, with participants' cognitive experiences assessed through periodic thought sampling. These tasks were performed in a laboratory setting so that the duration of worry could be equated across the groups and its impact unobtrusively measured. The procedure enabled us to track post-worry thought intrusions and concentration difficulties as they were taking place, in an immediate and concrete fashion, rather than relying on global, abstract summaries of experience that may be more susceptible to subjective influences. To determine whether particular beliefs about worry discriminated the two groups, participants subsequently completed a questionnaire based on Wells' metacognitive model.

To ensure that differences between the two worry groups could be attributed to GAD rather than to differences in worry severity, participants in the two groups were matched on their trait level of worry. By holding worry levels constant, the present study aimed to isolate features that are uniquely associated with the GAD diagnosis, as well as to provide additional information about non-GAD high worriers, a population whose investigation may enhance our understanding of anxiety but about whom little is presently known.

1. Method

1.1. Participants

A power analysis was conducted to identify an appropriate number of participants for the study. Prior research comparing high worriers with and without GAD on measures of worry and GAD symptomatology obtained large group differences (all ds ≥ 1.00; Ruscio, 2002); however, in light of the more conservative matching design of the present study, a somewhat smaller effect size ($d = 0.75$) was submitted to the power analysis. The analysis indicated that for an α of 0.05, a power level of 0.80 would be achieved with 28 participants per group. Thus, the final sample included 60 highly worried students (30 with GAD, 30 without GAD) enrolled in psychology courses at a large, northeastern university. Participants were primarily female (78%; $N = 47$) and Caucasian (88%; $N = 53$); sex and ethnicity were evenly distributed across the two worry groups.

1.2. Materials

1.2.1. Pre-experiment measures

Participants completed two self-report measures as part of a larger departmental questionnaire battery prior to the experimental session. The first was the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990), a 16-item measure assessing trait

worry characteristic of individuals with GAD. Items are rated on a 5-point Likert scale and are summed to form a total score ranging from 16 to 80. The PSWQ has excellent psychometric properties in student, community, and clinical samples (cf. Molina & Borkovec, 1994; van Rijsoort, Emmelkamp, & Vervaeke, 1999).

The second measure completed prior to the experiment was the Generalized Anxiety Disorder Questionnaire (GAD-Q-IV; Newman et al., 2002), a self-report diagnostic measure of GAD. This measure has good reliability and validity (e.g. Newman et al., 2002; Roemer, Borkovec, Posa, & Borkovec, 1995) and shares a high level of diagnostic agreement ($\kappa = 0.70$) with the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown, Di Nardo & Barlow, 1994) that is at least as high as the diagnostic agreement between two independent administrations of the ADIS-IV GAD module ($\kappa = 0.65$; Brown, Di Nardo, Lehman, & Campbell, 2001). The GAD-Q-IV is scored following the DSM algorithm for GAD, and individuals meeting all of the criteria are diagnosed with the disorder.

1.2.2. Experimental materials

The pre- and post-induction tasks were performed using an audiotape recorder, a tape on which a beeping sound was recorded at varying intervals, and a set of rating sheets. The tape was played for the full duration of both 5-min focused attention periods and was used to signal participants to report on their cognitive experiences. During the pretest, participants were signaled at 85, 115, 180, and 300 s. During the posttest, they were signaled at 45, 130, 240, and 300 s. At each signal, participants responded to a rating sheet containing a single question: "What were you doing when the beeper went off?" Participants chose from five response options: (1) completely focused on my breathing; (2) distracted by positive thoughts; (3) distracted by negative thoughts; (4) distracted by neutral thoughts; or (5) other. A separate rating sheet was completed at each signal so that participants would not be influenced by previous ratings or be able to infer the number of signals remaining.

1.2.3. Post-experiment measures

Participants completed two questionnaires after concluding all experimental tasks. The Post-Task Questionnaire asked participants to reflect on their experiences during the worry period and subsequent focused attention posttest. Questions assessed the nature, frequency, and intensity of worried thoughts experienced during each of the two tasks, as well as the somatic (restlessness, muscle tension, fatigue), cognitive (concentration difficulties), and emotional (distress, irritability) aftereffects of these tasks, to further assess whether worry and its consequences were experienced similarly by the two groups.

The second measure was the Meta-Cognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997), a scale assessing beliefs about worry and the need and ability to control thoughts. The MCQ contains five subscales: positive beliefs about worry; beliefs about the uncontrollability of worry and corresponding danger; confidence in one's own memory and attentional abilities; negative beliefs about thoughts (with themes of superstition, punishment, and responsibility); and preoccupation with one's cognitive processes. The scale has been demonstrated to have a stable factor structure and good reliability and concurrent validity in student and clinical samples (Cartwright-Hatton & Wells, 1997; Wells, 2000).

1.3. Design

The present study utilized a matching design. Half of the sample ($N = 30$) met DSM-IV criteria for GAD by the GAD-Q-IV. Each GAD-diagnosed participant was matched with a participant who received the same total score on the PSWQ (identical within one point), but who failed to meet one or more of the diagnostic criteria for GAD. This design was selected based on past research indicating that, despite considerable overlap between the PSWQ scores of highly worried individuals with and without GAD, those with a GAD diagnosis receive higher scores, on average, than their nondiagnosed counterparts (Ruscio, 2002). By equating the trait-worry severity reported by the two groups, this sampling scheme ensured that any group differences could not be attributed to differential worry severity, ruling out this important alternative hypothesis and more effectively isolating characteristics specific to GAD. Non-GAD high worriers endorsed an average of 1.5 (SD = 1.26) of the four primary diagnostic criteria of GAD, with 25% meeting criterion A, 56% meeting criterion B, 38% meeting criterion C, and 31% meeting criterion E for the disorder.

1.4. Procedure

Participants took part in an hour-long experimental session with the same female experimenter. Each session included a group of up to eight participants, some with and some without GAD, who worked independently on all experimental tasks. Participants were given a brief introduction to the study, provided with an informed consent form, and assured that their responses would remain confidential. Each participant was handed a questionnaire packet face-down and was asked not to turn over the pages until instructed to do so.

Participation began with a three-phase experimental procedure (cf. Borkovec, Robinson, Pruzinsky, & DePree, 1983), with each phase lasting 5 min. In the first phase (pretest), participants were asked to close their eyes and focus all of their attention on their breathing. They were informed that they would be signaled periodically throughout this breathing-focus task and that—when the signal sounded—they were to turn over the top sheet in front of them, indicate what they were doing at the time of the signal, set the sheet aside, then close their eyes and concentrate solely on their breathing until the next signal. Participants were taken through one practice round and given the opportunity to ask questions. Then, participants completed the 5-min breathing-focus task, being signaled four times. To ensure that all participants engaged in the task for the same length of time, the tape on which the signal was recorded was paused after each signal, then restarted after all participants had made a rating and had closed their eyes again.

Following the pretest, participants engaged in the second phase of the procedure (worry induction). Participants identified the topic about which they were currently most worried, then were asked to begin worrying about this topic intensely in their usual fashion and continue until they were asked to stop. Pilot testing of various worry periods had found a 5-min period to be long enough to elicit the worries and anxiety associated with a given topic, but not so long as to allow anxiety to decline. After 5 min of worrying, participants immediately entered the third phase of the procedure (posttest), in which they repeated the previous breathing-focus task. The posttest was used to assess the potentially disruptive influence of worry on the ability to successfully attend to and concentrate on a required task. As in the pretest, participants were signaled

four times and asked to report what they were doing at the time of the signal on the rating sheets provided.

Following the experimental procedure, participants completed the above-mentioned questionnaires. They were then orally debriefed by the experimenter and given a written debriefing sheet before leaving the laboratory. Participants received either extra credit in their psychology course or $6 in exchange for their participation; these forms of compensation were balanced over the two groups.

2. Results

2.1. Worry equivalence and representativeness

An alpha level of 0.05 was used for all statistical tests. To determine whether the matching design successfully equated the worry severity of the GAD and non-GAD groups, the PSWQ scores of the groups were compared using a paired-sample t-test. Results revealed that the GAD ($M = 67.43$, $SD = 9.50$) and non-GAD ($M = 67.27$, $SD = 9.37$) participants indeed reported comparable levels of worry severity, $t(29) = 1.15$, $p = 0.26$. These PSWQ scores were highly similar to those of individuals diagnosed with GAD by structured clinical interview in clinical ($M = 67.66$, $SD = 8.86$) and analogue ($M = 65.77$, $SD = 9.60$) samples (Molina & Borkovec, 1994), suggesting that our requirement that each GAD-diagnosed participant be matched with a non-diagnosed counterpart did not artificially lower the worry severity of the present sample. This finding also indicated that the present GAD group reported sufficiently severe worry to serve as an appropriate analogue for interview-diagnosed individuals in clinical settings.

2.2. Comparing experiences of worry

2.2.1. Experimental ratings

We began by comparing the degree of control over worry exhibited by equally worried GAD and non-GAD participants during the experimental procedure. Because participants were asked to choose between five response options at each of the eight thought assessments of the pre- and posttests, and because some of these responses were more common than others, some response categories received too few endorsements to be included individually in the data analysis. Therefore, rather than submitting the original five-category variables to analysis, two sets of dichotomous dependent variables were constructed. The first set of variables, labeled Negative Intrusions, compared the number of GAD and non-GAD high worriers who reported being distracted by negative thoughts during the pre- and posttests. Participants were placed into one of two categories at each thought assessment: those who were distracted by negative thoughts during that assessment versus those who endorsed any other response option (i.e. focused on breathing, distracted by positive thoughts, distracted by neutral thoughts, or "other"). The second set of variables, labeled Task Success, compared the number of GAD and non-GAD high worriers who successfully engaged in the task that they were given. Participants were divided into one of two categories at each thought assessment: those who reported focusing entirely on their breathing at the time of the signal versus those who did not (i.e. distracted by positive, negative, or neutral thoughts, or "other").

These two sets of variables were submitted in turn to a repeated measures analysis for categorical data (two populations, dichotomous response) using weighted least squares estimation (Stokes, Davis, & Koch, 1995). This analytic procedure was used in place of the more familiar chi-square procedure to permit the simultaneous inclusion of multiple thought samples in a single analysis, allowing us to examine the pattern of Negative Intrusions and Task Success over the course of the entire experimental task and to determine whether this pattern differed for GAD and non-GAD high worriers. The procedure is analogous to a repeated measures analysis of variance with one independent variable, but because it employs categorical rather than continuous data, it compares marginal proportions (rather than means) from each thought assessment, evaluating their homogeneity over time and across levels of the independent variable. We computed three effects: the main effect of time (before and after the worry induction), the main effect of group, and the interaction of group by time.

Analysis of the eight Negative Intrusions variables revealed a main effect of time, $\chi^2\ (7,\ N = 60) = 58.04,\ p < 0.0001$. Pairwise contrasts among the eight proportions indicated that a significant increase in negative intrusions occurred between the final thought sample of the pretest (immediately before the worry induction) and the first thought sample of the posttest (immediately after the worry induction). However, this difference rapidly disappeared and was no longer significant for subsequent post-worry thought samples, suggesting that negative intrusions caused by worrying were relatively short-lived.

The main effect of group was not significant, $\chi^2\ (1,\ N = 60) = 0.54,\ p = 0.46$, but there was a significant interaction of group by time, $\chi^2\ (7,\ N = 60) = 15.51,\ p = 0.03$. As shown in the top panel of Fig. 1, although both GAD and non-GAD high worriers reported an increase in negative intrusions immediately after the worry induction, a larger proportion of those diagnosed with GAD reported negative intrusions. This difference between the groups disappeared by the second posttest assessment as the rate of negative intrusions in the GAD group rapidly dropped to that reported by worriers in the non-GAD group.

Analysis of the eight Task Success variables using the same analytic approach revealed a significant main effect of time, $\chi^2\ (7,\ N = 60) = 39.96,\ p < 0.0001$. Marginal proportions indicated that participants grew increasingly distracted as the focused attention task continued, with significant declines in Task Success occurring even before the worry induction began. As can be seen in the bottom panel of Fig. 1, although a drop in Task Success occurred immediately after the worry induction, reports of successful attention to breathing quickly rebounded to the levels observed just prior to the worry induction. There was no significant main effect of group, $\chi^2\ (1,\ N = 60) = 2.12,\ p = 0.14$, nor a significant interaction of group by time, $\chi^2\ (7,\ N = 60) = 6.63,\ p = 0.47$. Together, these findings suggest that while participants did become increasingly distractible over time, GAD worriers were no less able to maintain attention to this task than were non-GAD high worriers, and the attentional ability of the two groups did not appear to be differentially affected by worrying. It is worth noting, however, that the rate of Task Success in this highly worried sample was uniformly low across all eight thought samples; only 38% of participants reported successful attention to their breathing when the first thought sample was collected 85 s into the pretest, and this percentage eroded considerably as the task continued.

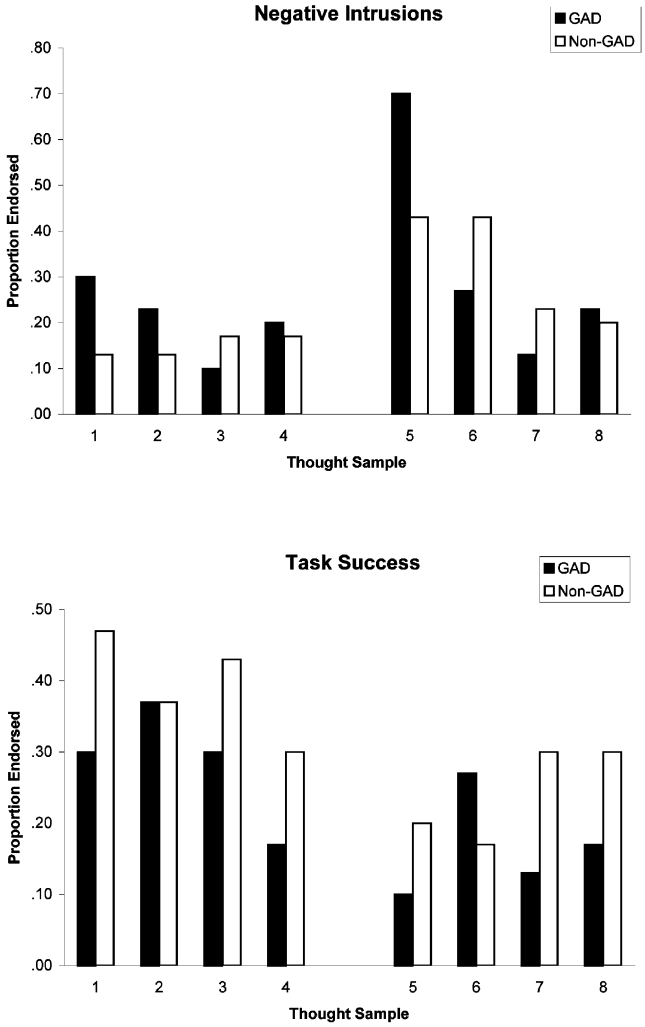

Fig. 1. Proportion of GAD and non-GAD high worriers reporting Negative Intrusions (top panel) and Task Success (bottom panel) before and after the worry induction. Thought samples 1–4 correspond to ratings made at 85, 115, 180, and 300 s during the pretest. Thought samples 5–8 correspond to ratings made at 45, 130, 240, and 300 s during the posttest.

2.2.2. *Post-Task Questionnaire*

Paired-sample *t*-tests were used to compare the cognitive experiences reported by GAD-diagnosed participants and their non-GAD worry matches during the worry period and subsequent focused attention task. Both groups reported spending an equivalent proportion of the worry period actually engaged in worry (78% vs. 74%), $t(29) = 0.58$, $p = 0.57$, suggesting that subsequent differences between the GAD and non-GAD worriers were unlikely to be due to differences in the quantity of their worrying. However, contrary to expectations, the two groups reported very similar experiences while engaged in worry and while resuming their efforts to

focus exclusively on their breathing. GAD and non-GAD participants rated their thoughts during the worry period as similarly unpleasant, $t(29) = 0.70$, $p = 0.49$, with both groups' means falling at a level corresponding to "moderately unpleasant." Furthermore, the two groups characterized their thoughts as equally anxious during this period, $t(29) = 0.11$, $p = 0.92$, with mean scores slightly higher than the "moderately anxious" level.

Similar results were obtained when participants reflected on their experiences during the focused attention task following the worry induction. Both groups reported that their thoughts during the posttest were slightly negative and slightly to moderately anxious, that they did a moderate amount of worrying during the posttest, and that they were "a little" to "somewhat" able to focus solely on their breathing, all $t(29) < 1.33$, all p's > 0.19. In addition, the groups reported that worried thoughts came into their minds with equal frequency during the posttest, that these worried thoughts were comparable in intensity, and that they were equally distressed by these worried thoughts, all $t(29) < 0.84$, all p's > 0.41. However, when asked how much control they felt they had over worry intrusions during the posttest, GAD-diagnosed participants ($M = 2.57$, $SD = 1.19$) reported significantly less perceived control than their non-diagnosed worry matches ($M = 3.50$, $SD = 1.70$), $t(29) = -2.58$, $p = 0.02$, with the GAD group mean falling between minimal and mild levels of control and the non-GAD group mean falling between mild and moderate perceived control.

Finally, participants were presented with the six symptoms comprising DSM-IV criterion C of GAD, as well as an item assessing overall emotional distress, and were asked to indicate the extent to which they were experiencing each symptom at the present moment. The groups did not differ in their levels of distress, fatigue, concentration difficulties, muscle tension, or irritability, all $t(29) < 1.52$, all p's > 0.14. However, they did differ in the degree to which they reported feeling restless, keyed up, or on edge, with GAD-diagnosed individuals ($M = 4.30$, $SD = 1.64$) reporting higher levels than those without the disorder ($M = 3.57$, $SD = 1.81$), $t(29) = 2.12$, $p = 0.04$. Along similar lines, the groups also differed in the extent to which they reported feeling relaxed, with GAD participants ($M = 2.70$, $SD = 1.51$) reporting lower levels of relaxation than non-GAD worriers ($M = 3.43$, $SD = 1.63$), $t(29) = -2.42$, $p = 0.02$. Across all items of the Post-Task Questionnaire, between-group effect sizes (Cohen's d) ranged from -0.18 to 0.64, with an average d of 0.20, suggesting that differences between the groups were generally small.

2.3. Appraisals of worry

Participants were administered the MCQ to explore the hypothesis that GAD is distinguished by the tendency to subjectively appraise worry as dangerous or problematic. Indeed, results suggested that despite the comparable level of worry severity reported by the two groups, they perceived their worrying in considerably different ways. As shown in Table 1, individuals diagnosed with GAD were significantly more likely than their worry-matched counterparts to perceive worry as harmful, dangerous, and out of their control (Uncontrollability and Danger); to believe that there will be disastrous consequences if worries and other thoughts are not kept under tight control (Superstition, Punishment, Responsibility); and to express doubt about their cognitive abilities, particularly their ability to accurately remember things (Cognitive Confidence), all $t(29) > 2.07$, all p's < 0.05. However, the groups did not differ in their endorse-

Table 1
Meta-Cognitions Questionnaire (MCQ) scale scores of GAD high worriers, Non-GAD high worriers, and unselected college students

MCQ scale	GAD	Non-GAD High Worriers	Unselected students[1]
Positive beliefs	39.66 (11.95)[a]	38.07 (11.05)[a]	35.8 (10.9)[a]
Uncontrollability and danger	50.47 (7.68)[a]	39.30 (8.68)[b]	32.1 (9.6)[c]
Uncontrollability	25.93 (4.37)[a]	19.80 (5.46)[b]	–
Danger	24.53 (4.03)[a]	19.50 (4.23)[b]	–
Cognitive confidence	23.40 (6.79)[a]	17.83 (4.81)[b]	17.9 (5.7)[b]
Superstition, punishment, responsibility	27.70 (8.00)[a]	23.83 (5.77)[b]	21.8 (6.2)[b]
Cognitive self-consciousness	20.57 (4.23)[a]	20.33 (4.63)[a]	18.2 (4.6)[b]

Values represent M (SD). Values in the same row that do not share superscripts differ at $p < 0.05$. GAD and non-GAD high worriers were compared using paired-sample t-tests; these groups were compared with the unselected student sample using independent-sample t-tests.

[1] Unselected student data ($N = 306$) obtained from Wells (2000).

ment of the benefits of worrying (Positive Beliefs), nor in the degree to which they reported thinking about, monitoring, or being aware of their thoughts (Cognitive Self-Consciousness), both $t(29) < 0.47$, both p's > 0.64.

Because the perception of one's worry as uncontrollable is a core diagnostic criterion of GAD, it was important to ascertain whether group differences on the Uncontrollability and Danger subscale were solely a function of the selection criteria used to construct the two groups. To test this possibility, the items of this subscale were separated by content into two scores, one representing the perceived uncontrollability of worry and the other representing the perceived dangerousness of worry. As shown in Table 1, GAD worriers were not only more likely to appraise their worrying as uncontrollable, $t(29) = 6.06$, $p < 0.001$, but were also more likely to appraise worry as dangerous and harmful, $t(29) = 4.40$, $p < 0.001$, than non-GAD worriers.

Although these results revealed key differences in the worry appraisals of high worriers with and without GAD, it was unclear whether the appraisals made by non-GAD high worriers could be distinguished from those of individuals experiencing lower worry levels. In other words, do non-GAD high worriers appraise their worry just as less worried people do, or are their elevated levels of worry—even in the absence of GAD—associated with different beliefs, perceptions, and interpretations of worry than those held by most others? To address this question, the MCQ scores of the present sample were compared with those of a university sample of 306 undergraduate and graduate students (46% female) employed in the validation of the MCQ (Cartwright-Hatton & Wells, 1997; Wells, 2000). Because the latter sample was not selected for any particular level of worry or anxiety, it was expected to include individuals with a wide range of trait worry, but to consist primarily of the low to moderate levels of trait worry that predominate in nonclinical samples.

Table 1 presents the results of independent-sample t-tests comparing this unselected sample to the two high worry groups on the five MCQ subscales. Interestingly, different patterns of

results were uncovered for different subscales. Non-GAD high worriers were more likely than the unselected students to appraise their worry as uncontrollable and dangerous, $t(334) = 3.95,\ p < 0.001$, despite weaker endorsement of these beliefs than their GAD matches. Both non-GAD and GAD high worriers also reported greater self-conscious monitoring of their thoughts than the unselected students, both $t(334) > 2.41,$ both p's < 0.05, though they did not differ from each other on this scale. By contrast, non-GAD high worriers were similar to the unselected students in cognitive confidence and in beliefs about the negative consequences of uncontrolled thoughts, both $t(334) < 1.73,$ both p's > 0.05, suggesting that such appraisals may be uniquely distinctive of GAD rather than typical of high worry more generally. Finally, the three groups did not differ in their endorsement of positive beliefs about worry, both $t(334) < 1.84,$ both p's > 0.05.

3. Discussion

The recent discovery of a large population of non-GAD high worriers who differ from GAD worriers in important ways has brought to light an intriguing question: Why do some high worriers suffer from significant impairment and distress as a result of their worrying, whereas others do not? The present study examined whether differences observed between high worriers with and without GAD could be attributed to group differences in actual worry experiences, in subjective appraisals of worry, or in both experiences and appraisals of worry. Comparison of GAD and non-GAD worriers matched on trait worry severity revealed similar experiences and consequences of worry in both groups following a brief worry induction. However, analyses also revealed several differences between the groups in both the experience and appraisal of worry.

The present findings corroborated prior indications that some negative consequences of worry are generally experienced by highly worried individuals, regardless of their GAD status. For example, GAD and non-GAD high worriers had similar difficulty focusing attention on their breathing before and after a 5-min worry period, with low initial levels of Task Success in both groups declining significantly over time. Although this measure of concentration has not routinely been found to be sensitive to worry status or worry inductions in prior research, one previous investigation (Borkovec, Robinson, Pruzinsky, & DePree, 1983), calculating success scores in a somewhat different way, revealed a significantly higher rate of task success among nonworriers (67%) than chronic worriers (49%), a rate that was also considerably higher than that observed among high worriers in the present study (38%). Hence, there is at least some indication that the impaired concentration measured by Task Success may be a distinguishing feature of severe worry, but little evidence that it is unique to GAD.

A somewhat different pattern of results emerged when thought samples were analyzed to examine participants' control over worry. First, induced worry was associated with a significant increase in subsequent negative thought intrusions for both worry groups. Analogous effects have been observed following brief state inductions of worry among unselected samples (York, Borkovec, Vasey, & Stern, 1987) and among nonworriers as well as chronic worriers (Borkovec, Robinson, Pruzinsky, & DePree, 1983), suggesting that worrying reduces control over negative thinking regardless of the trait worry level of the individual. However, the present study also

found that GAD worriers experienced a significantly greater increase in negative intrusions than non-GAD worriers immediately after the worry induction, a result that was echoed in worriers' self-reported experiences on the Post-Task Questionnaire. The finding that GAD-diagnosed individuals have particular difficulty controlling their worry, and that this difficulty cannot be attributed solely to the severity of their worry, supports the inclusion of criterion B (uncontrollability of worry) in the DSM-IV criterion set for the GAD diagnosis.

Interestingly, the more fine-grained analysis employed in the present study (relative to averaged thought sample data employed in prior studies) revealed that this differential increase in intrusions between the two worry groups was short-lived, disappearing by the second posttest thought sample. This suggests either that the global sense of uncontrollable worry reported by GAD-diagnosed individuals derives from fairly brief (though likely frequent) experiences of worried thoughts intruding into other tasks, or that the laboratory context of the task or externally determined onset and termination of the worry period did not sufficiently match participants' customary worry circumstances to produce long-lasting intrusive effects. Alternatively, the short-lived nature of these intrusions may be attributed to the analogue nature of the sample, whose GAD symptoms and associated impairment may be less severe than those of GAD-diagnosed individuals in clinical settings. Hence, research is needed to replicate the present findings in clinical samples, and to collect thought samples during naturally occurring worry and subsequent tasks in daily living, to determine the external validity of these results.

The present study also uncovered substantial differences in the subjective appraisals of worry endorsed by GAD and non-GAD high worriers. Comparison of their appraisals with those of an unselected university sample enabled us to more precisely isolate the beliefs about worry that are unique to high worriers, as well as those unique to GAD. Results revealed that positive beliefs about worry are shared by all individuals, regardless of their worry severity or GAD status, and that both GAD and non-GAD high worriers think about and monitor their thoughts more often than individuals whose worry is less severe. By contrast, GAD worriers were differentiated from both other groups by self-doubt about their ability to attend to and remember things, as well as by superstitious beliefs about the power of worry. Moreover, although the perception of worry as dangerous and out of one's control was elevated among non-GAD high worriers, it was still more elevated among equally worried individuals with GAD, even when uncontrollability and danger were considered separately to minimize overlap with the GAD diagnostic criteria. Thus, while positive beliefs about worry may be universal and general awareness of thoughts may vary as a function of worry severity, negative beliefs about worry appear to be quite distinctive of GAD.

These findings are quite consistent with Wells' (1995, 1997) metacognitive model of GAD, which asserts that positive beliefs about worry are shared by all worriers, whereas appraisals of worry as negative or harmful are distinctive of worriers with GAD. The discovery of large metacognitive differences between identically worried individuals on either side of the GAD diagnostic boundary suggests that subjective perceptions of worry may play an important role in GAD. At the same time, indications that the appraisal of worry as uncontrollable or dangerous is elevated among severe worriers without GAD (and is therefore not entirely unique to GAD) tentatively hints at a somewhat more complex association between negative appraisals, worry, and GAD than is proposed by the current model. Future investigations might fruitfully study how particular metacognitive appraisals are acquired and more closely examine their role in the

onset and maintenance of GAD. In particular, the Uncontrollability/Danger subscale of the MCQ, the only scale that differentiated all three groups in the present study and the scale that has most consistently distinguished GAD patients from panic disorder and social phobia patients in past research (Wells & Carter, 2001), may represent an especially promising avenue for research into the etiology of GAD. Finally, research is needed to determine whether negative appraisals of worry are best conceptualized as a cause, a symptom, or a consequence of GAD.

The present study had several significant strengths and limitations. First, by examining worry phenomena in a laboratory setting, we were able to equate the duration of worry across participants and measure its interference in a relatively immediate, concrete, and standardized fashion, thereby increasing internal validity. However, the highly controlled nature of this procedure may also be regarded as a limitation of the study, as it is unclear to what extent the worry evoked in this setting was representative of the unrestrained worry activity that is naturally elicited in reaction to life events. Second, the present sample was carefully assessed and diagnosed using established measures of worry and GAD, and the average worry scores of the two matched groups were comparable to those of treatment-seeking clients diagnosed with GAD by a structured clinical interview. Nevertheless, restriction of the sample to university students, and the use of a self-report measure to determine GAD status, temper the strength of conclusions that may be drawn from the study. In the absence of differential diagnoses yielded by comprehensive structured interviews, important questions remain about the success with which GAD worriers were distinguished from non-GAD worriers and from individuals whose anxiety is better represented by another disorder. Little is also known about the degree to which comorbid conditions may have contributed to observed differences between the GAD and non-GAD groups. The present results should therefore be regarded as tentative until they are replicated in other samples and in more naturalistic settings using comprehensive diagnostic interviews.

The present investigation is notable for discovering robust differences between GAD and non-GAD worriers despite identical levels of trait worry across these groups. The discovery of non-criterial features that differentiate a diagnostic group from a particularly stringent comparison group suggests that there is something distinctive about individuals with this diagnosis, and hence something informative about the diagnosis itself. In this way, the present findings provide support for the utility of the GAD diagnosis, over and above its cardinal feature of severe worry. At the same time, the many similarities revealed between high worry groups suggest that efforts to isolate the features that are truly unique to GAD require comparison with worry-matched controls, rather than with the nonworried controls that are routinely used in GAD research. Such targeted exploration of worry at the GAD diagnostic boundary is likely to yield more accurate descriptions of GAD that will, in turn, enhance our understanding of this complex disorder.

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