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DEVELOPMENT AND VALIDATION OF THE PENN STATE WORRY QUESTIONNAIRE

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Summary—The present report describes the development of the Penn State Worry Questionnaire to measure the trait of worry. The 16-item instrument emerged from factor analysis of a large number of items and was found to possess high internal consistency and good test–retest reliability. The questionnaire correlates predictably with several psychological measures reasonably related to worry, and does not correlate with other measures more remote to the construct. Responses to the questionnaire are not influenced by social desirability. The measure was found to significantly discriminate college samples (a) who met all, some, or none of the DSM-III-R diagnostic criteria for generalized anxiety disorder and (b) who met criteria for GAD vs posttraumatic stress disorder. Among 34 GAD-diagnosed clinical subjects, the worry questionnaire was found not to correlate with other measures of anxiety or depression, indicating that it is tapping an independent construct with severely anxious individuals, and coping desensitization plus cognitive therapy was found to produce significantly greater reductions in the measure than did a nondirective therapy condition.

Generalized anxiety disorder (GAD) is cardinally defined by chronic worry (DSM-III-R, APA, 1987), and the process of worry is pervasive throughout all of the anxiety disorders (Barlow, 1988). Identifying the nature and functions of worry should thus contribute significantly to our understanding of anxiety and its disorders. Although the concept of worry has had a fairly long empirical tradition in the test anxiety literature (e.g. Deffenbacher, 1980), only recently have concerted experimental effort been devoted to its elucidation. Studies variously contrasting self-labeled worriers and nonworriers and/or inducing states of worry have demonstrated the distinctiveness and some of the potential functions of this cognitive aspect of anxious responding. During induced worry, *S*s show a shift toward greater frontal EEG activation relative to rest, and worriers display significantly greater left (relative to right) hemisphere activation than do nonworriers (Carter, Johnson & Borkovec, 1986). Induction of worry produces a greater increase in negative thought intrusions on a subsequent task than does neutral induction (Borkovec, Robinson, Pruzinsky & DePree, 1983), whereas the induction of a somaticaly anxious state does not (York, Borkovec, Vasey & Stern, 1987). Experimentally created states of depression or somatic anxiety result in some mood effects unique to each state, but induced worry yields a mixture of anxious and depressive emotional experience (Andrews & Borkovec, 1988). Trait, as well as state manipulations of, worry lead to delayed response in decision-making tasks (Metzger, Miller, Cohen, Sofka & Borkovec, 1990). Mentation sampling yields a predominance of imagery over thought among relaxing nonanxious *S*s, whereas relaxing GAD clients report equal percentages of image and thought. Moreover, worry induction produces for both groups a shift toward predominance of thought over imagery, and posttesting of GAD clients after successful therapy reveals a normalization of these thought/image ratios (Borkovec & Inz, 1990). Evidence also exists that worry may inhibit the processing of phobic information and thus contribute to the maintenance of anxiety disorders and/or interfere with the process of change ordinarily invoked by exposure-based treatments for these problems (Borkovec & Hu, 1990).

Given the importance of the construct of worry to the anxiety disorders and hints from the above research of its unique qualities and effects, further research into its definition, nature, and functions would be facilitated by a psychometrically sound self-report assessment device. Prior research has selected worriers primarily on the basis of one question ("What percent of the day do you typically worry?"). Although previous work has identified worry vs emotionality subscales in the test anxiety

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area (Deffenbacher, 1980; Spielberger, Gonzalez, Taylor, Anton, Algaze, Ross & Westberry, 1980), and anxiety scales have been developed to tap globally defined cognitive vs somatic experience for general populations (e.g. Cognitive Somatic Anxiety Questionnaire, Schwartz, Davidson & Goleman, 1978) or for specific anxiety disorders (e.g. Agoraphobic Cognitions Questionnaire and the Bodily Sensations Questionnaire, Chambless, Caputo, Bright & Gallagher, 1984), no instrument has yet emerged principally to measure the specific trait of worry for general use. The present article reports the development of the Penn State Worry Questionnaire, and preliminary research into its relibility and validity.

STUDY I

Development of the Questionnaire

Several sources were used to generate a pool of 161 items considered to be relevant to the construct of worry: the fourth author's clinical and research experience with worry and GAD, entries made in daily diaries by GAD clients in a therapy outcome study (Borkovec & Mathews, 1988), items from a cognitive/somatic anxiety inventory (Borkovec & Mathews, 1988), and generation of items by the first author on the basis of theoretical views of worry.

These items were given in questionnaire form to 337 college students in an introductory psychology class who returned the completed form at their next class. Items were rated on a 1–5 point scale ('not at all typical of me' to 'very typical of me'). Several items were stated in a reversed fashion to reduce the effects of acquiescence. Principal components factor analysis with oblique rotation and calculation of internal consistency were applied to the resulting data. The factor structure yielded one general factor (22.6% of the variance) and several smaller factors reflecting concerns over physical safety and health (4.2%), concerns over social evaluation (3.1%), beliefs in worry as a positive coping strategy (2.6%), depression and lack of optimism about life (2.1%), and concerns about future success in relationships (1.7%). Coefficient α (average of all split-half correlations, Anastasi, 1982) was 0.97 for the 161 items.

Items making up the general factor were retained if reversed-scored items loaded $\geqslant 0.30$ and others loaded $\geqslant 0.40$. Analyses of the resulting 58 items yielded a coefficient α of 0.97. A repeated cycle of deletion of further items due to lowest loadings, ambiguous language, or redundancy with other items and re-calculation of internal consistency ultimately produced a 16-item questionnaire with a coefficient α of 0.93 (see Table 1 for the items and their loadings on the general factor from the original factor analysis).

Table 1. PSWQ items and their loadings on the general factor of the original factor analysis

	Item	Loading
(1)	If I do not have enough time to do everything, I do not worry about it.*	−0.38
(2)	My worries overwhelm me.	0.73
(3)	I do not tend to worry about things.*	−0.62
(4)	Many situations make me worry.	0.66
(5)	I know I should not worry about things, but I just cannot help it.	0.67
(6)	When I am under pressure I worry a lot.	0.64
(7)	I am always worrying about something.	0.65
(8)	I find it easy to dismiss worrisome thoughts.*	−0.57
(9)	As soon as I finish one task, I start to worry about everything else I have to do.	0.53
(10)	I never worry about anything.*	−0.43
(11)	When there is nothing more I can do about a concern, I do not worry about it any more.*	−0.40
(12)	I have been a worrier all my life.	0.56
(13)	I notice that I have been worrying about things.	0.65
(14)	Once I start worrying, I cannot stop.	0.73
(15)	I worry all the time.	0.64
(16)	I worry about projects until they are all done.	0.53

General factor eigenvalue = 36.4; 22.6% of the variance.
*Reverse-scored item.

STUDY II

This Penn State Worry Questionnaire (PSWQ) was administered to 405 (228 females) introductory psychology college students in a large group testing session to re-assess its internal consistency and to generate normative descriptive statistics. The state and trait versions of the State–Trait Anxiety Inventory (STAI, Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983) and the Beck Depression Inventory (BDI, Beck, Ward, Mendelson, Mock & Erbaugh, 1961) were also given to subsamples of the students. Other questionnaires were also administered to various subsets of students during the same session by other researchers and provided an opportunity to examine the relationship of worry to other psychological constructs. They included: the Test Anxiety Inventory (Spielberger *et al.*, 1980), the Self-Handicapping Scale (Jones & Rhodewalt, 1982), the Self-Esteem Certainty Index (Harris & Snyder, 1986), Rotter's (1966) Internal–External Locus of Control, and Zuckerman's (1979) Sensation Seeking Scale (Form V) with its four subscales of Thrill Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility.

Results

The mean for the total group was 48.8, with a standard deviation of 13.8 (mean for females = 51.2, for males = 46.1). The entire range of possible scores for PSWQ (16–80) was represented in the sample scores. The mean was close to the middle possible score of 48. Females scored significantly higher than males, $t(404) = 3.24$, $P < 0.002$. Coefficient α was 0.93 for the total group.

The correlation of PSWQ with STAI-Trait, $r(389) = 0.64$, $P < 0.001$, was substantially higher than with STAI-State, $r(395) = 0.49$, $P < 0.001$, or with the BDI, $r(154) = 0.36$, $P < 0.001$. Unexpectedly, PSWQ showed a higher correlation with the Emotionality subscale of the Test Anxiety Inventory, $r(250) = 0.58$, $P < 0.001$, than with its Worry subscale, $r(250) = 0.40$, $P < 0.001$. There are two possible reasons why the PSWQ failed to relate predictably to these subscales. First, the Test Anxiety Inventory is a specific measure of anxiety in a circumscribed situation, whereas the PSWQ is a general trait measure. Second, the original factor analysis of Spielberger *et al.*'s (1980) Inventory had resulted in a peculiar outcome. Their two items containing the word, 'worry', did not load into the Worry Subscale. One item contributes only to the total score, while the second item loaded more strongly on the Emotionality Subscale. Results from subsequent studies described below show more predictable relationships between worry and the cognitive and somatic aspects of anxiety.

A significant positive correlation emerged between PSWQ and the Self-Handicapping Scale, $r(227) = 0.33$, $P < 0.001$, indicating that high worry relates to a greater tendency to arrange some outside factor to interfere or to claim that some uncontrollable internal factor interferes with misperformance (Leary & Shepperd, 1986). High worriers were also characterized by low Self-Esteem, $r(215) = -0.34$, low Thrill Seeking, $r(220) = -0.20$, $P < 0.001$, and low Boredom Susceptibility, $r(220) = -0.21$, $P < 0.002$. No relationship was found, however, between PSWQ and Internal–External Locus of Control, Experience Seeking, or Disinhibition.

STUDY III

A subset of 47 *S*s from Study II were chosen from the highest (8 males, 7 females), middle (9, 8), and lowest 7, 8) 20% of the PSWQ scores for investigation of test–retest reliability, discriminant validity, and construct validity. A 48th *S* with mistaken group test score was excluded from all but within-lab session correlation analyses. *S*s came into the laboratory 8–10 weeks after the group testing session and completed the PSWQ and the Cognitive Somatic Anxiety Questionnaire (Schwartz *et al.*, 1978). They also participated in a brief interview with one of two interviewers, each of whom met with nearly equal numbers of *S*s from each Worry Level Group. The interview involved asking *S*s to list in 2 min all of the topics about which they worried, to rate each topic on a 0–100 point scale representing the percentage of time in the last week spent worrying about that topic, and to rate each topic on a 1–7 point scale representing the significance of the topic to them. This interview was taken from Vasey and Borkovec (1986) who had found that self-labeled

worriers reported more worry topics and greater percentage of time worrying that nonworriers, although the two groups did not differ in the significance of their topics.

Results

Test–retest reliability was quite high, $r(45) = 0.92$, $P < 0.001$. PSWQ correlated significantly with the Cognitive Somatic Anxiety Questionnaire total, $r(46) = 0.69$, $P < 0.001$, its Cognitive Subscale, $r(46) = 0.70$, $P < 0.001$, and to a lesser degree, its Somatic Subscale, $r(46) = 0.55$, $P < 0.001$.

One-way (Worry Level Group) analysis of variance applied to the number of worrisome topics generated in the interview was significant, $F(2, 44) = 5.14$, $P < 0.01$. Mean number of topics for high, medium, and low Worry Level Groups was 9.07, 6.41 and 5.93, respectively.

Estimates of percentage of time spent worrying about each topic were averaged for each *S* across topics. One-way analysis of variance on these averages yield a significant effect for Worry Level Group, $F(2, 44) = 3.62$, $P < 0.05$. High worriers spent more time during the preceding week worrying (42.6%) than did the medium (26.9%) or low (24.5%) worriers. No Worry Level Group effect was found in analysis of the average significance of the worry topics.

STUDY IV

The PSWQ was administered to two new samples of introductory psychology college students from two different universities. The first sample included 286 *S*s (164 females) and was tested primarily to re-assess the internal consistency of the questionnaire. A psychometric reanalysis of the PSWQ was performed on the resulting scores and again the instrument demonstrated a high degree of internal consistency ($\alpha = 0.94$). The mean for the total group was 46.7 with a standard deviation of 14.01 (mean for females = 49.1, for males = 43.3, $t(284) = 3.53$, $P < 0.01$).

The second sample of 165 *S*s (89 females) was used primarily to examine the effect of social desirability on the PSWQ and the test–retest reliability of responses at 2 weeks and at 4 weeks. *S*s were administered the PSWQ, the Marlowe–Crowne Social Desirability Scale (Crowne & Marlowe, 1964), the Rosenberg Self-Esteem Inventory (1979) and the Rotter (1966) Locus of Control Scale. At 2 and 4 weeks post-administration, random samples of 60 *S*s were invited for retesting and again completed the PSWQ as well as two items asking what percent of the day they typically (a) worried and (b) felt tense.

The mean for the total group at first test was 45.7, with a standard deviation of 13.5 (mean for females = 48.0, for males = 43.0, $t(163) = 3.40$, $P < 0.01$).

The PSWQ was found to be a stable over periods of 2 weeks, $r(56) = 0.75$, $P < 0.001$, and 4 weeks, $r(52) = 0.74$, $P < 0.001$. Responses to the PSWQ were not significantly related to social desirability as measured by the Marlowe–Crowne Social Desirability Scale, $r(163) = -0.09$. PSWQ scores were related to both the percentage of the day feeling tension, $r(163) = 0.44$, $P < 0.01$, and the percentage of the day spent worrying, $r(163) = 0.64$, $P < 0.001$. Because the worry and tension percentages were also correlated, $r(163) = 0.71$, the partial correlation with PSWQ scores corrected for the intercorrelation was also computed. The correlation between the PSWQ and the level of daily worry remained significant when corrected for daily tension level, $r(163) = 0.52$, $P < 0.001$, while the correlation between PSWQ and tension level corrected for daily worry dropped dramatically, $r(163) = -0.03$. High worriers were found to have lower self-esteem, $r(165) = -0.29$, but the PSWQ was once again not significantly related to internal–external locus of control.

STUDY V

Study V re-assessed test–retest reliability of the PSWQ and evaluated the extent to which individual differences in worry were associated with the usage of various coping strategies in stressful encounters and the affective outcomes of those encounters. The very concept of worry might imply that at least some individuals have adopted a set of coping strategies in which the person focuses on his/her own incapacities in concert with an excessive focus on the negative implications of the present task, rather than using strategies that seek to master task demands. If this expectation is correct (and previous results of ours would imply that it is, e.g. the positive correlation with the Self-Handicapping Scale and the negative correlation with self-esteem),

previous research on coping and affect would suggest that chronic worriers should experience elevated levels of negative affect in response to stressful events, due to their use of less adaptive coping mechanisms. (See Folkman & Lazarus, 1988; McCrae & Costa, 1986; and Miller & Thayer, 1991, for results indicating that neurotic or maladaptive coping strategies are often associated with elevated levels of negative affect.)

A new sample of 73 students (38 females) enrolled in courses in introductory management and personnel management at the Study I university completed the PSWQ, 48 of whom were available 1 month later for retesting. Within a week after the first administration, *S*s in the introductory management class ($n = 32$) took their first exam and were then given feedback on their performance on the exam. One week after being given their exam scores, *S*s responded to a questionnaire containing the Ways of Coping Scale (Lazarus & Folkman, 1984) and a 24-item mood measure. On the coping scale, *S*s indicated how often each strategy had been used in response to their exam outcome in the week since they had been given feedback, using four point scales (1 = did not use it at all, or does not apply, 4 = used it a great deal). For the mood measure, *S*s indicated on five point scales (1 = not at all, 5 = a great deal) how much of each emotion they currently felt in response to their exam score. Based on research and theory indicating that positive and negative affects are relatively independent constructs (e.g. Diener & Emmons, 1984; Watson & Tellegen, 1985), the mood measure was used to construct separate measures of positive affect and negative affect. Examples of emotional adjectives composing the two scales were: confident, eager, happy, exhilarated, and excited for positive affect; and ashamed, annoyed, anxious, depressed, and agitated for negative affect.

From the Ways of Coping Scale, twelve coping strategies were derived, based upon the factor analysis performed by Miller and Thayer (1991). These coping straegies, with an example item from each resulting scale, were: wishful thinking and dread (wished that the situation would go away or somehow be over with); ignoring the situation (did not let it get to me; refused to think about it); action planning (came up with a couple of different solutions to the problem); self-blame (realized I brought the problem on myself); looking for the positive (looked for the silver lining; tried to look on the bright side of things); reflection (I tried to see things from the other person's point of view); feeling expression (talked to someone about how I was feeling); information seeking and analysis (I asked a relative or friend I respected for advice); isolation (kept others from knowing how bad things were); externalizing to others (tried to get the person responsible to change his or her mind); problem avoidance (turned to work or substitute activity to take my mind off things); and tension reduction (tried to make myself feel better by eating, drinking, smoking, using drugs or medication).

Results

The PSWQ again demonstrated strong internal consistency (α of 0.95 at both test and retest). The mean for the whole test sample at first testing was 53.7, with a standard deviation of 14.2 (means for females = 53.1, for males = 54.4, $t(71) = 0.35$, NS). The 1-month test–retest correlation was $r(46) = 0.93$, $P < 0.001$.

In order to evaluate whether PSWQ predicted coping and affective responses to exam scores, hierarchical regressions (Cohen & Cohen, 1975) were performed in which the PSWQ and Exam Scores were entered as a block of main effects, followed by the PSWQ × Exam Score cross-product term, for each of the affective and coping criteria. The overall model for negative affect was significant, $F(2, 26) = 19.71$, $P < 0.001$. The multiple correlation for the two main effects was 0.78, indicating that 60.3% of the variance in negative affect could be accounted for. More importantly, each main effect was significant: the exam score $\beta = -0.78$, $P < 0.001$; PSWQ $\beta = 0.26$, $P < 0.05$. The interaction term was not significant, nor were any of the PSWQ effects significant for positive affect. Thus, persons scoring higher on the PSWQ later reported higher negative affect in response to their exam scores. The lack of an interaction yields the interesting implication that worriers experienced more negative emotion over their exam scores, regardless of how high or low those scores were.

Similar analysis involving the coping measures indicated that none of the cross-product terms were significant. However, three coping strategies did yield significant or marginally significant relationships with the PSWQ. The overall model was significant for Self-blame, $F(2, 26) = 4.77$,

$P < 0.02$. The multiple correlation was equal to 0.52, indicating that the two main effects were able to account for 26.8% of the variance. The effects for each variable were significant: exam score $\beta = -0.43$, $P < 0.02$; PSWQ $\beta = 0.37$, $P < 0.04$. The model for Wishful thinking and dread was marginally significant, $F(2, 26) = 3.22$, $P < 0.06$. The multiple correlation was 0.45, yielding 19.9% of the variance. The only significant main effect was for the PSWQ, $\beta = 0.40$, $P < 0.04$. Finally, the model for Problem avoidance was marginally significant, $F(2, 26) = 2.69$, $P < 0.09$. The multiple correlation was 0.41, for a total amount of variance predicted of 17.1%. The only marginally significant effect was for the PSWQ, $\beta = 0.36$, $P < 0.06$. In sum, the regression analyses indicated that, with exam scores controlled, higher scores on the PSWQ were associated with higher levels of self-blame, wishful thinking, and problem avoidance. Because these forms of coping are typically associated with poorer outcomes, they are consistent with the previously mentioned positive relationship between worry tendencies and negative affect.

STUDY VI

In the next study, we sought to identify personality measures that might be associated, either positively or negatively, with individual differences in worry. The following measures were chosen: Fenigstein, Scheier, and Buss' (1975) Self-Consciousness Scale, which provides measures of private and public self-consciousness as well as social anxiety; Leary, Shepperd, McNeil, Jenkins, and Barnes' (1986) Objectivism scale, a measure of one's tendency to make decisions on the basis of rational information; Cacioppo, Petty, and Kao's (1984) Need for Cognition short-form measure, an indicator of a person's preference for and enjoyment of cognitive tasks; Burns' (1980) Perfectionism Scale; Paulhus and Martin's (1988) short form of the Battery of Interpersonal Capabilities, a measure of 'functional flexibility' or a person's ability to adapt behavior to the demands of the interpersonal situation; Hogan and Cheek's (1983) measures of personal and social identity; Burger and Cooper's (1979) Desire for Control Scale, a measure of one's motivation to be in control of significant events in one's life; Landy, Thayer, and Colvin's (1988) Time Urgency Scales, which assess a variety of dimensions of the time urgency component of the Type A syndrome; and Sarason's (1984) Reactions to Tests, a multidimensional measure of test anxiety which provides more clearly differentiated measures of cognitive and somatic anxiety components.

These measures, along with the PSWQ, were administered to 87 (42 females, 2 not identified) introductory psychology students at a new university. Beyond correlating the PSWQ with the personality measures, an attempt was made to identify a subset of constructs that together could account for a significant percentage of the variance in PSWQ scores and thus to determine unique characteristics of worriers.

Results

The internal consistency (coefficient $\alpha = 0.91$) and descriptive statistics (total group mean = 51.5, SD = 12.7; mean for females = 53.3, for males = 50.1, $t(83) = 1.15$, NS) for the PSWQ were consistent with previous results.

A number of measures were significantly associated with the PSWQ. All three of the subscales from the Self-Consciousness Scale were positively correlated with the PSWQ, rs (85) = 0.26 to 0.38, Ps < 0.05, as were all four of the components of Reactions to Tests, rs (85) = 0.31 to 0.61, Ps < 0.01. A stepwise multiple regression using the four scales of the latter measure (worry, task-irrelevant thinking, tension, and bodily symptoms) indicated that only the worry subscale predicted PSWQ, $F(1, 84) = 52.58$, $R^2 = 38.5\%$, $\beta = 0.62$, $P < 0.001$. Also positively correlated with the PSWQ were the Perfectionism Scale, General Time Urgency, and the latter scale's Nervous Energy subscale, rs (85) = 0.39, 0.47 and 0.23, respectively, Ps < 0.05. No other correlations were significant.

Each of the personality measures along with a gender factor was entered into a stepwise regression analysis in an attempt to ascertain whether a core set of characteristics defined individual differences in worry. (Reactions to tests and the social anxiety subscale from the Self-Consciousness Scale were deleted because each merely taps a different facet of worry or anxiety and so would not help to illuminate the nature of individual differences in worry.) A set of five characteristics was found to account for a total of 47.2% of the variance in PSWQ scores (multiple correlation = 0.69).

In order of entry into the equation, with percentages of unique variance accounted for noted in parentheses, the significant predictors were General Time Urgency (24.1%), Private Self-Consciousness (7.3%), Desire for control (6.5%), Perfectionism (5.7%), and the Speech Patterns subscale of the time urgency measure (3.6%). Desire for Control and Speech Patterns were negatively related to worry, while the other measures were positive correlates. With the present set of measures, then, the defining features of worry are chronic tendencies toward self-evaluation and self-examination, a preference for avoiding control over events that affect oneself, unhurried speech patterns, extremely demanding standards for one's own task performances, and general tendencies toward feeling rushed and pressed for time. Because Desire for Control and Speech Patterns were not significantly related to PSWQ scores in preliminary simple correlation analyses, it would appear that they only distinguish worriers and nonworriers once these groups have been equated on, for example, Private Self-Consciousness. Finally, worriers do not appear to be significantly different from nonworriers in terms of the strength of their identities, the degree of their interpersonal flexibility, or their more general preferences with regard to cognitive activities.

STUDY VII

Our next study attempted to determine criterion group validity. A new sample of 392 introductory psychology students completed the PSWQ as well as two questionnaires specifically assessing the presence of DSM-III-R symptoms of (a) generalized anxiety disorder and (b) posttraumatic stress disorder. *S*s who met all of the criteria for both disorders ($n = 4$) were deleted. Remaining *S*s were categorized into those who met all, some, or none of the GAD criteria, and separately into those who met all, some, or none of the PTSD criteria. Analysis of variance on the GAD groups revealed a significant effect, $F(2, 394) = 94.25$, $P < 0.001$. *S*s meeting all GAD criteria ($n = 48$, 26 females, mean = 64.1, SD = 8.6) scored significantly higher by Scheffe *post hoc* comparison than those who met only some criteria ($n = 189$, mean = 52.3, SD = 12.2), the latter differing significantly from those who met none of the criteria ($n = 160$, mean = 40.1, SD = 11.8). Within the GAD criterion group, males and females did not differ significantly. Although *S*s meeting all criteria for PTSD diagnosis scored higher on the PSWQ ($n = 11$, 8 females, mean = 57.4, SD = 7.3) than those meeting some or none of the criteria, analysis of variance revealed no significant effect. Finally, those who met all GAD criteria scored significantly higher on the PSWQ than those who met all PTSD criteria, $F(1, 57) = 6.01$, $P < 0.02$. Thus, the PSWQ significantly discriminated between two anxiety disorder groups as well as among criterial levels of the GAD group.

STUDY VIII

An ongoing therapy outcome study on GAD afforded the opportunity to examine the PSWQ with a clinical sample centrally characterized by chronic worry. Thus far, 34 clients have been diagnosed with primary GAD by two separate psychiatric assessors using the revised version of the Anxiety Disorder Interview Schedule (DiNardo, O'Brien, Barlow, Waddell & Blanchard, 1983) and have completed 12 sessions of protocol treatment in one of three conditions: nondirective therapy, applied relaxation training, or coping desensitization plus cognitive therapy. Prior to the beginning of therapy, clients were assessed on the PSWQ as well as five other main outcome measures [trait version of the State–Trait Anxiety Inventory, Zung Self-Rating for Anxiety (Zung, 1975), the BDI, and psychiatric assessor ratings of the Hamilton Anxiety Rating Scale and the Hamilton Rating Scale for Depression (Hamilton, 1959, 1960)].

Gender was not significantly related to pretherapy PSWQ score. The mean for males ($n = 13$) was 67.8, with a standard deviation of 7.9, and the mean for females ($n = 21$) was 68.4, with a standard deviation of 6.3. The intercorrelation matrix on the pretherapy variables revealed that PSWQ correlated with none of the other measures, whereas 7 of the 10 correlations among these others were significant (see Table 2).

A two-way repeated measures multivariate analysis of variance (Therapy conditions by pre-posttest) conducted on PSWQ scores revealed no significant pretherapy differences among conditions, whereas the condition by pre-posttest interaction was significant, $F(2, 62) = 3.67$,

Table 2. Intercorrelation matrix of PSWQ and other pretherapy anxiety and depression measures from 34 GAD clients

	PSWQ	STAI	Hamilton anxiety	Hamilton depression	Zung anxiety
PSWQ	—				
STAI	0.18	—			
Hamilton anxiety	−0.09	0.00	—		
Hamilton depression	−0.06	0.19	0.38*	—	
Zung anxiety	0.02	0.44*	0.50*	0.36*	—
BDI	−0.10	0.36*	0.29*	0.52*	0.65*

*$P < 0.05$.

$P < 0.05$, Scheffe *post hoc* comparisons indicated that coping desensitization plus cognitive therapy produced greater reductions in PSWQ scores ($n = 12$, means = 67.9 to 44.8) than did nondirective therapy ($n = 12$, means = 66.7 to 59.2); applied relaxation fell nonsignificantly between these two groups ($n = 10$, means = 70.2 to 53.2).

Results from GAD clients therefore indicated very high scores on the PSWQ, absence of gender differences, independence of worry from common measures of anxiety and depression, and specific sensitivity to cognitively oriented therapy.

DISCUSSION

The PSWQ appears to be a spychometrically sound self-report instrument with good validity for assessing the trait of worry. Internal consistency is high, and test–retest reliability is quite good. In unselected college samples, the measure correlates positively with other emotional disturbance questionnaires, with assessments of other psychological constructs meaningfully related to pervasive worry (e.g. self-esteem, perfectionism, and time urgency), and with specific maladaptive ways of coping with environmental stress. Social desirability does not appear to influence responses to the PSWQ.

The most important validity information comes from analogue GAD college subjects (Study VII) and clinical *S*s suffering from primary GAD (Study VIII). In the former sample, the PSWQ distinguished levels of diagnosable GAD and yielded higher scores among GADs than among diagnosable PTSD cases. In the clinical sample, the complete absence of significant correlation between PSWQ and other pretherapy measures indicates that worry is a construct independent of anxiety and depression (as these constructs are commonly assessed) among carefully diagnosed and moderately severe cases of GAD. Finally, preliminary outcome results indicate that worry is responsive to treatment, especially treatment that includes a combination of coping desensitization and cognitive therapy procedures.

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