

Stöber, J., & Bittencourt, J. (1998). Weekly assessment of worry: An adaptation of the Penn State Worry Questionnaire for monitoring changes during treatment. *Behaviour Research and Therapy*, 36(6), 645-656.

Weekly Assessment of Worry: An Adaptation of the Penn State Worry Questionnaire for Monitoring Changes During Treatment

Joachim Stöber and Jussara Bittencourt

Department of Psychology, FB 12 WE 07, Free University of Berlin,
Habelschwerdter Allee 45, D-14195 Berlin, Germany

Summary

An adaptation of the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990, *Behaviour Research and Therapy*, 28, 487-495) for weekly assessment of worry was evaluated in a brief treatment study. Cognitive restructuring techniques were taught to 28 nonclinical high-worriers, 14 of whom served as a control group in a lagged waiting-list design. Results showed that the Penn State Worry Questionnaire-Past Week (PSWQ-PW) was highly reliable and substantially valid in the assessment of both (a) weekly status of worry and (b) treatment-related changes in worry: Average Cronbach's alpha was 0.91; average convergent correlation with a past-week adaptation of the Worry Domains Questionnaire (Tallis, Eysenck, & Mathews, 1992) was 0.63; and pre-post improvement on PSWQ-PW showed a 0.71 correlation with the Questionnaire of Changes in Experiencing and Behavior (Zielke & Kopf-Mehnert, 1978). It is concluded that the PSWQ-PW is a useful instrument to monitor pathological worry in experimental and applied settings.

Keywords

anxiety neurosis, therapy outcome, change measurement, questionnaires, reliability, validity, worry

Weekly Assessment of Worry: An Adaptation of the Penn State Worry Questionnaire for Monitoring Changes During Treatment

The Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a reliable and valid self-report measure of trait-like pathological worry. This article describes an adaptation of the PSWQ for a weekly assessment of worry, the Penn State Worry Questionnaire-Past Week (PSWQ-PW). To estimate its reliability and validity, the PSWQ-PW was administered to monitor changes in worry within a brief intervention study directed at reducing pathological worry in a sample of nonclinical high-worriers.

In the literature, the PSWQ (Meyer *et al.*, 1990) is the most frequently used self-report questionnaire on pathological worry. With 16 items, the PSWQ is short and easy to administer. Items are directed at the excessiveness, duration, and uncontrollability of worry and associated stress as experienced in clients diagnosed with generalized anxiety disorder (GAD; American Psychiatric Association, 1994). Despite its brevity, the PSWQ has demonstrated high reliability with respect to both internal consistency and test-retest reliability. Cronbach's alphas have been shown to range between 0.86 and 0.95 (on average 0.90) in both clinical and nonclinical samples. Furthermore, five independent studies reported test-retest correlations between 0.74 and 0.92 (on average 0.85) across intervals ranging from two to ten weeks (Molina & Borkovec, 1994; Stöber, *in press*).

With respect to validity, the PSWQ has also demonstrated substantial convergent validity with other measures of worry and anxiety as well as significant mean differences between criterion groups. With the Worry Domains Questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992), for example, the PSWQ has shown a weighted average of $r = 0.63$ across studies (range: 0.47 to 0.68, *cf.* Stöber, *in press*). Apart from this, the PSWQ has been shown to discriminate anxiety clients from normal controls as well as GAD clients from other anxiety clients, in adults (Brown, Antony, & Barlow, 1992; Molina & Borkovec, 1994) and in elderly persons (Beck, Stanley, & Zebb, 1996). Moreover, a recent adaptation for children and adolescents has shown good discrimination between children diagnosed with GAD and children diagnosed with other anxiety disorders (Chorpita, Tracey, Brown, Collica, & Barlow, 1997). The only critical account of the PSWQ thus far comes from a study that found the PSWQ unable to discriminate GAD clients from clients diagnosed with major depressive episode (Starcevic, 1995). Collectively, however, the

data suggest that the PSWQ possesses high reliability, high temporal stability, and substantial validity in the assessment of trait-like worry status.

A different issue is whether the PSWQ is also sensitive for the assessment of short-term change, for example, in therapeutic interventions aimed at reducing pathological worry. The reason is that the PSWQ has been constructed to serve as a measure of trait-like worry. This is shown in the PSWQ's answer format. Respondents are asked how characteristic worry symptoms are of them on a five-point scale ranging from Not at all typical to Very typical. Typicality, however, implies stability. With this format, the PSWQ is unlikely to capture short-term changes in worry. The respondent may still consider dysfunctional worry as typical and characteristic, even though his/her level of worry has recently changed significantly.

To our knowledge, there is only one publication so far in which the PSWQ was used to assess change. In a comparative therapy-outcome study with GAD clients, Borkovec and Costello (1993) administered the PSWQ four times: (1) prior to treatment, (2) after six weeks of therapy sessions (twice a week), (3) after six months, and (4) after twelve months. PSWQ scores showed significant declines from pre-treatment to post-treatment assessment for the two therapy groups (applied relaxation and cognitive-behavioral therapy [CBT]), but not for the group that received nondirective therapy. After that, there were no further significant changes for all three groups. Thus, the PSWQ was able to capture treatment-induced changes across an interval of six weeks.

However, there may well be situations that demand a more frequent assessment of pathological worry in order to answer important questions. Within the study by Borkovec and Costello (1993), for example, it would have been of interest whether the two treatments (applied relaxation versus CBT) showed different rates of change. One method may have achieved significant changes faster or may have leveled off earlier than the other method. As another example, consider within-participants designs such as multiple-treatment counterbalanced designs (cf. Kazdin, 1980). All participants would receive the same experimental conditions (e.g., applied relaxation and CBT) but in a different order. Here, monitoring therapy-related changes in pathological worry might tell the researcher which order in a combined treatment is fastest in producing lasting changes. Finally, consider controlled practice (Petermann, 1982) in which a practitioner wants to monitor his or her GAD client's progress during treatment. In order to capture short-term changes in pathological worry, the PSWQ has to be adapted for more frequent administration.

The aim of the present study therefore was to examine an adaptation of the PSWQ directed at a weekly assessment of pathological worry, the PSWQ-PW. To estimate its reliability and validity, the PSWQ-PW was administered prior to, during, and after three weeks of a brief intervention directed at worry reduction in nonclinical high-worriers. For additional validity information, (a) an adaptation of the Worry Domains Questionnaire (Tallis *et al.*, 1992) was included in the weekly assessments and (b) the Questionnaire of Changes in Experiencing and Behavior (Zielke & Kopf-Mehnert, 1978) was administered at post-treatment assessment.

Method

Participants

Participants were recruited via postings ("Are you worrying too much?") at the three Berlin universities for a study to evaluate a brief intervention for worry reduction. Inclusion criterion for participation was excessive pathological worry as defined by a PSWQ score in the upper 25% of the distribution of the German version (see Stöber, 1995, p. 59, Table 7). By this criterion, women scoring above 49 and men scoring above 45 were eligible to participate. Participants who did not qualify but who were interested in counseling/therapy were given the address of the student counseling service of the Free University.

A total of $N = 28$ (23 women) was included for participation. Mean age was 30.3 years ($SD = 10.1$). Mean PSWQ score was 60.86 ($SD = 7.08$; range: 46 to 74), a value well in line with PSWQ means reported for analog clinical samples and for clinical samples (see Molina & Borkovec, 1994, p. 270, Table 11.2).

Instruments

Penn State Worry Questionnaire-Past Week (PSWQ-PW). The original PSWQ (Meyer *et al.*, 1990; German version by Stöber, 1995) was reformulated for retrospective assessment using a time frame of one week. For this adaptation, (a) the instructions were changed emphasizing during the past week as the time frame for the self-ratings, (b) the items were rephrased to past tense, and (c) the answer scale was changed to a seven-point rating format ranging from Never (0) to Almost always (6). PSWQ Item 12 ("I've been a worrier all my life") was dropped because the trait-like phrase "worrier all my life" did not match with the new time frame. Thus, the past-week version of the PSWQ (PSWQ-PW) consisted of 15 items (Table 2).

Worry Domains Questionnaire-Past Week (WDQ-PW). The Worry Domains Questionnaire (WDQ; Tallis *et al.*, 1992; German version by Stöber, 1995) was selected as a second measure of worry. Like the PSWQ, the WDQ represents a short, easy-to-administer, reliable, stable, and valid measure of worry (e.g., Joormann & Stöber, 1997; Stöber, 1995, *in press*; Tallis, Davey, & Bond, 1994). Despite different background and focus (the PSWQ [with a clinical background] is a measure of pathological worry whereas the WDQ [with a personality background] is a measure of nonpathological worry), the two questionnaires have shown substantial convergent correlations (*cf.* Introduction). To serve as a measure of convergent validity for the PSWQ-PW, the WDQ was also reformulated. The original formulation of the 25 items describing everyday worries (e.g., "that I will lose close friends" or "that I am not able to afford things") was retained; only the item prefix was changed to "During the past week, I worried ...". Adding the seven-point answer scale of the PSWQ-PW, this resulted in the past-week version of the WDQ (WDQ-PW).

Questionnaire of Changes in Experiencing and Behavior (QCEB). To further validate changes in pathological worry, the Questionnaire of Changes in Experiencing and Behavior (QCEB; Zielke & Kopf-Mehnert, 1978) was included. The QCEB is a change-sensitive instrument constructed to evaluate changes in client-centered psychotherapy. For 42 items (e.g., "I feel more relaxed and balanced" or, reverse-scored, "I have less self-confidence"), the participant is requested to imagine a given point of time (usually pre-treatment) and then to rate the changes experienced since then on a seven-point scale ranging from Significant change in item direction (7) to Significant change in opposite direction (1). Thus, QCEB scores can range from 42 (maximal change to the worse) to 294 (maximal change to the better). With internal consistency at 0.95 and highly significant differences between treatment and waiting-list group (Zielke, 1980), the QCEB has demonstrated high reliability and substantial validity.

Procedure

All participants met with the therapist (the second author) for five sessions: one general information session, three treatment sessions, and one final session for discussion of progress and remaining problems. The three treatment sessions consisted of (1) problem analysis and setting of positive treatment goals (e.g., "I want to be more relaxed" or "I want to be able to say 'no' to other people's requests," instead of "I do not want to worry so much"); (2) reconstruction of typical worry episodes, thereby self-monitoring of early precipitants of worry, recognition of typical reactions and sequences that lead to

continuous spirals of worry; (3) 'replay' of the worry episodes elaborated in the previous session, thereby inserting relaxation techniques and imagery of alternative, positive developments and outcomes at critical points (see Bittencourt, 1996, for details). All sessions were held individually, except for the first session that was held in groups of five to seven participants. At the end of the final session, all participants received a written summary of the techniques they had learned.

Altogether, the study comprised 12 weeks (see Figure 1). In Week 1, all participants met for the information session. Then, participants were randomly allocated to one of two waves to form a lagged waiting-list design (Wave 2 serving as the control group for Wave 1). For Wave 1 ($n = 14$), the three treatment sessions were conducted on a weekly basis in Weeks 2-4 followed by the final session in Week 5. For Wave 2 ($n = 14$), the three treatment sessions were conducted in Weeks 5-7 with the final session in Week 8.

At the beginning of each session, participants filled out the two worry questionnaires (first PSWQ-PW, then WDQ-PW). At the final session, they also filled out the QCEB. Previous research has repeatedly demonstrated improvements in anxiety due to repeated measurement (Knowles, Coker, Scott, Cook, & Neville, 1996). Therefore, participants of Wave 2 did not receive weekly worry assessment during waiting period. Instead the number of worry assessments was kept constant across waves. Thus, each participant's past-week worry was assessed five times.

Four-week follow-up assessments could be obtained only from 24 participants. However, to maximize statistical power, all inferential statistics were calculated only for the full sample ($N = 28$; Assessments 1-5). Descriptive statistics for the follow-up subsample ($n = 24$; Assessment 6) can be found in Table 1 and Figure 1.

Results

Reliability

To estimate the reliability of the PSWQ-PW scores, Cronbach's alphas were calculated for each of the five assessments (Table 1). Despite small sample size and variance restriction due to the selection of high-worriers, the PSWQ-PW displayed an average Cronbach's alpha of 0.91 (range: 0.84 to 0.93). With this value, the PSWQ-PW surpasses the 0.80 value recommended for widely-used scales (Carmines & Zeller, 1979). Item analysis was conducted by averaging item-total correlations across the five assessments (Table 2). All items displayed satisfactory correlations, except Item 1. With a

corrected item-total correlation of $r_{it} = 0.21$, Item 1 was at the 0.20 margin below which item revision is strongly recommended (Schelten, 1980).

Whereas the PSWQ-PW displayed the same high internal consistency as the original, test-retest correlations were much lower, particularly during treatment. Moreover, this effect was specific for the PSWQ-PW. The WDQ-PW showed both high internal consistency (average Cronbach's alpha of 0.90, range: 0.87 to 0.93) and high test-retest correlations across all assessments, as demonstrated below.

First, we examined the two pre-treatment assessments (Assessments 1 and 2) separately for the two waves. For Wave 1, there was a one-week interval between the first two assessments. Here, the PSWQ-PW showed a test-retest correlation of $r = 0.60$, $p < 0.05$ and the WDQ-PW a test-retest correlation of $r = 0.86$, $p < 0.001$. For Wave 2, there was a four-week interval between the first two assessments. There, the PSWQ-PW showed a test-retest correlation of $r = 0.10$, NS* whereas the WDQ-PW showed one of $r = 0.91$, $p < 0.001$. However, the low test-retest correlation of the PSWQ-PW was due to an outlier. One participant displayed extreme scores at opposite ends on the two assessments, namely a score of 18 at Assessment 1 and one of 73 at Assessment 2. When this participant was excluded, the test-retest correlations for Wave 2 were virtually the same as for Wave 1: $r = 0.59$, $p < 0.05$ for the PSWQ-PW and $r = 0.92$, $p < 0.001$ for the WDQ-PW. (In all other analyses, however, this participant was well in line with the rest of the sample.) Thus, during the waiting period, PSWQ-PW displayed substantial temporal stability. Still, the above outlier indicated that PSWQ-PW scores may show high temporal fluctuations and that pre-treatment scores should be averaged to get a stable base-line measure.

Next, we examined Assessments 2-5. These assessments could be aggregated across waves because, starting with Assessment 2, the assessment intervals were equal for the two groups (i.e., once a week). When intercorrelating the four PSWQ-PW assessments, the six resulting correlations had a mean of $r = 0.29$, NS (range: 0.04 to 0.64). In contrast, the correlations between the respective WDQ-PW assessments showed a mean of $r = 0.77$, $p < 0.001$ (range: 0.63 to 0.90). Thus, only the PSWQ-PW displayed a pattern of results expected for a change-sensitive worry measure when there are changes of worry due to

*NS = not significant ($p \geq 0.05$). Throughout this article, statistical hypotheses are directional. Therefore, all p values pertain to one-tailed tests.

treatment. As intended, the treatment procedures had a greater impact on pathological worry (i.e., how participants worried) than on nonpathological worry (i.e., what participants worried about).

The low test-retest correlation of the PSWQ-PW is of great importance when it comes to calculating differences between two scores. All other things equal, the reliability of a difference score $A-B$ is a function of the correlation between A and B . More reliable differences will result with scores that are each highly reliable but have low correlations with one another (Crocker & Algina, 1986). This exactly was the case for the PSWQ-PW scores.

Validity

With respect to validity, we expected (a) substantial covariation of PSWQ-PW scores and WDQ-PW scores, (b) substantial covariation of PSWQ-PW scores with the treatment schedule of the brief intervention, and (c) substantial covariation of PSWQ-PW difference scores with the respective WDQ-PW difference scores and with the Questionnaire of Changes in Experiencing and Behavior (QCEB) when comparing pre-treatment and post-treatment PSWQ-PW scores.

As to the first prediction, PSWQ-PW scores correlated substantially with the WDQ-PW scores across all five assessments, average $r = 0.63$, $p < 0.001$ (see Table 1 for the individual correlations). This value corresponds exactly to the average correlation reported for the original versions of the two questionnaires (cf. Introduction). Thus, the convergent correlation of the PSWQ-PW was as high as the one of the original version.

As to the second prediction, PSWQ-PW scores showed significant covariations with the treatment schedule (see Figure 1): There were no significant differences between Assessment 1 (past-week worry prior to the information meeting) and Assessment 2 (past-week worry prior to the first treatment session). After the first treatment session, however, weekly worry dropped markedly throughout the treatment period, indicating high change-sensitivity of PSWQ-PW total scores (see Table 1 for significances). To examine the sensitivity of the individual items, pre-treatment item means were calculated by averaging across both pre-treatment assessments (Assessments 1 and 2) and post-treatment item means were calculated from Assessment 5. All pre-treatment/post-treatment differences were significant (Table 2) indicating high change-sensitivity also for the individual items. This included Item 1, suggesting that this item should be retained despite its low item-total correlation.

As to the third prediction, we calculated differences between all possible pairs of the five PSWQ-PW measurements and correlated them with the respective WDQ-PW differences scores. The resulting ten correlations had an average of $r = 0.52$, $p < 0.01$ (range: 0.32 to 0.75), indicating substantial convergent validity of PSWQ-PW difference scores.

Finally, we calculated pre-treatment scores for PSWQ-PW and WDQ-PW, again by averaging both pre-treatment assessments (Assessments 1 and 2). From this aggregate, we subtracted the scores of the post-treatment assessment (Assessment 5). The resulting worry reduction was $\Delta\text{PSWQ} = 23.91$ ($\text{SD} = 19.93$) for the PSWQ-PW and $\Delta\text{WDQ} = 16.04$ ($\text{SD} = 12.76$) for the WDQ-PW. Both differences were highly significant, $t_{s(27)} \geq 6.35$, $p_s < 0.001$. Also the QCEB at Assessment 5 indicated positive changes in experiencing and behavior: When evaluating their changes from pre-treatment to post-treatment, participants showed a QCEB mean of 211.57 ($\text{SD} = 34.00$) thus indicating a highly significant change to the better according to the change-norms of the manual (Zielke & Kopf-Mehnert, 1978, p. 41). Correlating the worry difference scores with QCEB scores resulted in a substantial correlation for ΔPSWQ ($r = 0.71$) as well as for ΔWDQ ($r = 0.61$; both $p_s < 0.001$). However, when QCEB scores were regressed on the two difference scores simultaneously, only the regression weight of ΔPSWQ was significant ($\beta = 0.54$, $p < 0.01$) whereas that of ΔWDQ was not ($\beta = 0.27$, NS). Thus, the positive changes that participants experienced through treatment were specifically related to reduction of pathological worry, as assessed by the PSWQ-PW difference scores, and not to reduction of nonpathological worry.

Discussion

The major purpose of the present study was to examine the psychometric properties of the PSWQ-PW, an adaptation of the Penn State Worry Questionnaire for weekly assessment of pathological worry. The collective results suggest that the PSWQ-PW possesses excellent reliability (internal consistency) and substantial convergent validity. Generally, the PSWQ-PW appeared capable to assess both (a) weekly status of worry and (b) treatment-related changes of worry during treatment. This was demonstrated by a substantial covariation with the treatment schedule and substantial correlations with the past-week adaptation of the Worry Domains Questionnaire (Tallis *et al.*, 1992). Moreover, PSWQ-PW difference scores showed high correlations with the respective difference

scores of the other worry measure and were able to make a substantial prediction of self-reported changes in experiences and behavior as measured with the Questionnaire of Changes in Experiencing and Behavior (Zielke & Kopf-Mehnert, 1978), even when changes in nonpathological worry were statistically controlled for. In sum, the data suggest the utility of the PSWQ-PW for both researchers and practitioners interested in monitoring status and changes in pathological worry. Moreover, the high internal consistency combined with low test-retest correlation provides a good basis for the calculation of reliable difference scores both for groups of clients (e.g., in therapy research) and for single cases (e.g., in clinical practice).

Notwithstanding the favorable results, the present study has limitations. In the present study, all participants were undergoing treatment. Therefore there may have been some perceived demand that they report lower scores at the end of treatment. Consequently, it remains unclear whether the PSWQ-PW was sensitive to true treatment-related changes or whether the changes in scores were primarily due to expectancy or demand effects. However, the demand explanation is unlikely to account for the significant worry reduction following the first treatment session (see Table 1 and Figure 1) because the participants knew that the actual worry-reduction techniques were taught only in the third session. The first session consisted "only" of problem analysis and setting of a positive treatment goal. Whereas this is unlikely to have raised expectancy or demand, problem analysis and positive goal-setting are major components of cognitive therapy for worry and generalized anxiety disorder (Borkovec & Newman, *in press*). Therefore, at least the lower PSWQ-PW scores after the first week may represent true treatment-related changes. Still, future studies should address this question, for example, by including an experimental condition with counter-demand manipulations (cf. Borkovec, Wilkinson, Folensbee, & Lerman, 1983).

Other limitations are related to the small sample size of the present study. First, with 28 participants, a direct comparison of adaptation (PSWQ-PW) and original (PSWQ) was not recommendable as this could have reduced reliability and statistical power. Self-ratings of past-week worry and self-ratings of typical worry on the same measurement occasion could produce error in both measures: Participants may underestimate typical worry after reporting low levels of past-week worry, or they may overestimate past-week worry after reporting high typicality of worry. Unreliable measures, however, reduce statistical power (Sutcliffe, 1980). In larger samples, these effects can be controlled for

either by design (e.g., half of the participants fill out the PSWQ, half the PSWQ-PW) or statistically (e.g., with latent state-trait models; Majcen, Steyer, & Schwenkmezger, 1988; Schmitt & Steyer, 1993). This was not possible with our small sample. Therefore, there remain doubts if researchers and practitioners really need the PSWQ-PW, as Borkovec and Costello (1993) have already shown that the PSWQ has some sensitivity to treatment-related change. However, with respect to the different time-frames of the two questionnaires (past-week vs. typicality), we would assume that the PSWQ-PW is superior in measuring short-term changes. Consider, for example, a chronic worrier with a stable level of high pathological worry. One week of low worry would be untypical. Consequently, it should not affect his or her typicality ratings in the PSWQ. Thus, beginning improvement is likely to go unnoticed when using the PSWQ instead of the PSWQ-PW. Still, future studies should provide a direct comparison of the two measures to explore the utility of the PSWQ-PW over the PSWQ in capturing short-term changes.

Second, with 28 participants, it was not possible to conduct a factor analysis of the items to examine whether the PSWQ-PW had the same factor structure as the original (Meyer *et al.*, 1990; Stöber, 1995). Third, with 28 participants, the generalizability of the findings is arguable because most of the statistics reported possess large confidence intervals. For the claim of high internal consistency, this is unproblematic. With $N = 28$, the reported alpha of 0.91 has a 95% confidence interval from 0.81 to 0.95. Thus, an internal consistency above 0.80 can be assumed safely. The reported average test-retest correlation of $r = 0.29$, however, has a 95% confidence interval from -0.09 to 0.60 . With such a range, reliability of difference scores remains an open question: A correlation near zero would provide highly reliable difference scores whereas one near 0.60 would greatly reduce this reliability (Crocker & Algina, 1986). Future research will therefore need to evaluate the PSWQ-PW in larger samples to corroborate the present findings and to further investigate its psychometric properties. Nevertheless, based on the present findings, it appears that the PSWQ-PW may be useful for applications in research and practice with the interest of monitoring status of and changes in pathological worry from week to week.

References

American Psychiatric Association (Ed.). (1994). Diagnostic and statistical manual of mental disorders: Fourth edition. Washington, DC: Author.

Beck, J. G., Stanley, M. A., & Zebb, B. J. (1996). Characteristics of generalized anxiety disorder in older adults: A descriptive study. Behaviour Research and Therapy, *34*, 225-234.

Bittencourt, J. (1996). Kurzzeitintervention zur Besorgnisreduzierung bei Hochbesorgten: Studie zur Evaluation einer Methode der kognitiven Umstrukturierung [Brief intervention for worry reduction in high-worriers: Evaluation of a cognitive-restructuring method]. Unpublished master's thesis, Free University of Berlin, Germany.

Borkovec, T. D., & Costello, E. (1993). Efficacy of applied relaxation and cognitive-behavioral therapy in the treatment of generalized anxiety disorder. Journal of Consulting and Clinical Psychology, *61*, 611-619.

Borkovec, T. D., & Newman, M. G. (in press). Worry and generalized anxiety disorder. In P. Salkovskis (Ed.), Comprehensive clinical psychology. Oxford, England: Elsevier.

Borkovec, T. D., Wilkinson, L., Folensbee, R., & Lerman, C. (1983). Stimulus control applications to the treatment of worry. Behaviour Research and Therapy, *21*, 247-251.

Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. Behaviour Research and Therapy, *30*, 33-37.

Carmines, E. G., & Zeller, R. A. (1979). Reliability and validity assessment. Beverly Hills, CA: Sage.

Chorpita, B. F., Tracey, S. A., Brown, T. A., Collica, T. J., & Barlow, D. H. (1997). Assessment of worry in children and adolescents: An adaptation of the Penn State Worry Questionnaire. Behaviour Research and Therapy, *35*, 569-581.

Crocker, L., & Algina, J. (1986). Introduction to classical and modern test theory. New York: Holt, Rinehart, and Winston.

Joormann, J., & Stöber, J. (1997). Measuring facets of worry: A LISREL analysis of the Worry Domains Questionnaire. Personality and Individual Differences, *23*, 827-837.

Kazdin, A. E. (1980). Research design in clinical psychology. New York: Harper and Row.

Knowles, E. S., Coker, M. C., Scott, R. A., Cook, D. A., & Neville, J. W. (1996). Measurement-induced improvement in anxiety: Mean shifts with repeated assessment.

Journal of Personality and Social Psychology, 71, 352-364.

Majcen, A.-M., Steyer, R., & Schwenkmezger, P. (1988). Konsistenz und Spezifität bei Eigenschafts- und Zustandsangst [Consistency and specificity in trait and state anxiety]. Zeitschrift für Differentielle und Diagnostische Psychologie, 9, 105-120.

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. Behaviour Research and Therapy, 28, 487-495.

Molina, S., & Borkovec, T. D. (1994). The Penn State Worry Questionnaire: Psychometric properties and associated characteristics. In G. C. L. Davey & F. Tallis (Eds.), Worrying. Perspectives on theory, assessment, and treatment (pp. 265-283). New York: Wiley.

Petermann, F. (1982). Einzelfalldiagnose und Klinische Praxis [Single-case assessment and clinical practice]. Stuttgart, Germany: Kohlhammer.

Schelten, A. (1980). Grundlagen der Testbeurteilung und Testerstellung [Principles of test analysis and test construction]. Heidelberg, Germany: Quelle und Meyer.

Schmitt, M. J., & Steyer, R. (1993). A latent state-trait model (not only) for social desirability. Personality and Individual Differences, 14, 519-529.

Starcevic, V. (1995). Pathological worry and major depression: A preliminary report. Behaviour Research and Therapy, 33, 55-56.

Stöber, J. (1995). Besorgnis: Ein Vergleich dreier Inventare zur Erfassung allgemeiner Sorgen [Worry: A comparison of three questionnaires for the measurement of general worries]. Zeitschrift für Differentielle und Diagnostische Psychologie, 16, 50-63.

Stöber, J. (in press). Reliability and validity of two widely-used worry questionnaires: Self-report and self-peer convergence. Personality and Individual Differences.

Sutcliffe, J. P. (1980). On the relationship of reliability to statistical power. Psychological Bulletin, 88, 509-515.

Tallis, F., Davey, G. C. L., & Bond, A. (1994). The Worry Domains Questionnaire. In G. C. L. Davey & F. Tallis (Eds.), Worrying. Perspectives on theory, assessment, and treatment (pp. 285-297). New York: Wiley.

Tallis, F., Eysenck, M. W., & Mathews, A. (1992). A questionnaire for the measurement of nonpathological worry. Personality and Individual Differences, 13, 161-168.

Zielke, M. (1980). Methodische Untersuchungen zum Veränderungsfragebogen des Erlebens und Verhaltens (VEV) [Methodological examinations of the Questionnaire of Changes in Experiencing and Behavior (QCEB)]. Zeitschrift für Differentielle und Diagnostische Psychologie, 1, 43-55.

Zielke, M., & Kopf-Mehnert, C. (1978). Veränderungsfragebogen des Erlebens und Verhaltens [Questionnaire of Changes in Experiencing and Behavior]. Weinheim, Germany: Beltz Test Gesellschaft.

Acknowledgments

Preparation of this article was supported in part by German Research Foundation (DFG) grant STO 350/1-1 to the first author. We would like to thank Thomas D. Borkovec, Alexandra M. Freund, and Peter J. Gianaros as well as Steven Taylor and one anonymous reviewer for valuable comments and suggestions on earlier versions of this article.

Correspondence concerning this article should be addressed to Joachim Stöber who is now at the Department of Psychology, Ernst-Moritz Arndt University of Greifswald, Franz-Mehring-Str. 47, D-17487 Greifswald, Germany.

Table 1

Descriptive Statistics, Reliabilities, and Convergent Correlations of the Two Worry Questionnaire Adaptations for the Six Assessments

| Questionnaire | Assessment | | | | | |
|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 ^a |
| PSWQ-PW | | | | | | |
| <u>M</u> | 58.50 _a | 58.61 _a | 45.43 _b | 44.54 _b | 34.64 _c | 36.48 |
| (<u>SD</u>) | (15.95) | (11.70) | (16.48) | (15.50) | (16.76) | (16.75) |
| Cronbach's alpha | .92 | .84 | .92 | .91 | .93 | .93 |
| WDQ-PW | | | | | | |
| <u>M</u> | 36.79 _a | 37.79 _a | 30.68 _b | 27.61 _b | 21.25 _c | 24.25 |
| (<u>SD</u>) | (16.61) | (15.51) | (18.31) | (15.83) | (14.56) | (17.54) |
| Cronbach's alpha | .88 | .87 | .93 | .91 | .92 | .94 |
| <u>r</u> (PSWQ-PW, WDQ-PW) | 0.54** | 0.32* | 0.68*** | 0.66*** | 0.81*** | 0.78*** |

Note. N = 28. PSWQ-PW = Penn State Worry Questionnaire-Past Week, WDQ-PW = Worry Domains Questionnaire-Past Week (see Methods section for details). Within rows, means with different subscripts differ significantly at $p < 0.05$, one-tailed t tests. Measurement 6 (the four-week follow-up) was excluded from these analyses because its means are based on only $n = 24$ and are thus not directly comparable to the other means.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a $n = 24$.

Table 2

The Penn State Worry Questionnaire-Past Week (PSWQ-PW). Items, Average Item-Total Correlations, and Item Means at Pre-Treatment and Post-Treatment Assessment

| Items ^a | r_{it} ^b | Pre/post-treatment comparison ^c | | | | | |
|--|-----------------------|--|-------------|----------|-------------|---------|---------|
| | | Pre | | Post | | $t(27)$ | p |
| | | <u>M</u> | <u>(SD)</u> | <u>M</u> | <u>(SD)</u> | | |
| 1. If I didn't have enough time to do everything, I didn't worry about it. (R) | 0.21 | 1.84 | (1.07) | 3.00 | (1.52) | -3.79 | < 0.001 |
| 2. My worries overwhelmed me. | 0.77 | 3.43 | (1.24) | 1.50 | (1.40) | 5.00 | < 0.001 |
| 3. I didn't tend to worry about things. (R) | 0.49 | 1.54 | (1.09) | 2.96 | (1.64) | -4.14 | < 0.001 |
| 4. Many situations made me worry. | 0.74 | 3.91 | (1.12) | 2.04 | (1.45) | 5.41 | < 0.001 |
| 5. I knew I shouldn't have worried about things, but I just couldn't help it. | 0.63 | 3.70 | (1.12) | 1.96 | (1.48) | 5.83 | < 0.001 |
| 6. When I was under pressure, I worried a lot. | 0.76 | 4.13 | (1.02) | 2.18 | (1.39) | 5.56 | < 0.001 |
| 7. I was always worrying about something. | 0.77 | 4.14 | (1.33) | 1.89 | (1.42) | 6.21 | < 0.001 |
| 8. I found it easy to dismiss worrisome thoughts. (R) | 0.69 | 2.36 | (1.10) | 3.46 | (1.43) | -3.08 | < 0.01 |
| 9. As soon as I finished one task, I started to worry about everything else that I had to do. | 0.66 | 3.68 | (1.34) | 1.96 | (1.60) | 5.71 | < 0.001 |
| 10. I did not worry about anything. (R) | 0.63 | 0.59 | (0.67) | 2.61 | (1.77) | -6.29 | < 0.001 |
| 11. When there was nothing more I could do about a concern, I didn't worry about it anymore. (R) | 0.36 | 2.16 | (1.11) | 3.18 | (1.93) | -2.86 | < 0.01 |
| 12. I noticed that I had been worrying about things. | 0.59 | 3.91 | (1.29) | 2.71 | (1.51) | 3.79 | < 0.001 |

(Table 2, continued)

| | | | | | | | |
|--|------|------|--------|------|--------|------|---------|
| 13. Once I started worrying, I couldn't stop. | 0.75 | 3.59 | (1.20) | 1.82 | (1.59) | 4.82 | < 0.001 |
| 14. I worried all the time. | 0.79 | 3.30 | (1.33) | 1.29 | (1.44) | 5.12 | < 0.001 |
| 15. I worried about projects until they were all done. | 0.50 | 3.25 | (1.64) | 2.50 | (1.60) | 2.20 | < 0.05 |

Note. N = 28. The PSWQ-PW instructions read as follows: "For each of the following statements, please indicate how often the statement was characteristic of you during the past week." The answer scale had the following categories: Never (0), Very rarely (1), Rarely (2), Sometimes (3), Often (4), Very often (5), Almost always (6).

^a(R) indicates reverse-score items. ^bMean corrected item-total correlation (averaged across Assessments 1-5); reverse-score items were reversed prior to calculation. ^cPre-treatment mean represents the average of Assessments 1 and 2.

Figure Caption

Figure 1. Assessment of past-week worry for Wave 1 (■, $n = 14$; therapy in Weeks 2-4) and Wave 2 (□, $n = 14$; therapy in Weeks 5-7). Follow-up assessment at Weeks 9 and 12, only with $n = 12$ each. PSWQ-PW = Penn State Worry Questionnaire-Past Week, WDQ-PW = Worry Domains Questionnaire-Past Week.

Figure 1

