Chapter 3

Capturing worry in daily life: Are trait questionnaires sufficient?

Bart Verkuil, Jos F. Brosschot & Julian F. Thayer
Abstract

Worry is crucial in the development and maintenance of anxiety disorders and has been associated with several other adverse health outcomes. Yet, little is known about the frequency and perseveration of worry in daily life, and its predictability by widely used trait questionnaires.

In this study 432 students completed the Penn State Worry Questionnaire (PSWQ), the Worry Domains Questionnaire (WDQ) and the State Trait Anxiety Inventory-Trait Version (STAI-T) and kept a log of worry frequency and duration during six consecutive days and nights.

The results showed that worry is a very common phenomenon that is predicted by the two trait worry questionnaires, independent of trait anxiety. The often clinically utilized PSWQ predicted worry duration better than the WDQ, and exclusively predicted night-time worry and several other indices of perseverative and potentially pathogenic worry.

Although this study provides some support for the predictive validity of the PSWQ and the WDQ, these questionnaires did not account for the larger part of variance in daily worry. Future studies of worry and its associated perseverative processes should consider using momentary assessments.
Introduction

Perseverative cognition, such as worry and rumination, is crucial in the development and maintenance of mood disorders, anxiety disorders and insomnia (Borkovec, Ray, & Stöber, 1998; Nolen-Hoeke, 2000). Moreover, perseverative cognition is attracting growing interest in research concerned with the somatic health effects of stress (for a review see: Brosschot, Gerin, & Thayer, 2006). A great deal of research on perseverative cognition has focused on worry, which is traditionally studied in relation to anxiety and insomnia (Borkovec, Robinson, Pruzinsky, & DePree, 1983). For example, uncontrollable and excessive worries are the core characteristics of generalized anxiety disorder (GAD; American Psychiatric Association, 1994). Recently, worry has also been found to predict depressive mood (Hong, 2007), post traumatic stress symptoms (Holeva, Tarrier, & Wells, 2001) and subjective health complaints (Brosschot & Van Der Doef, 2006; Petrie et al., 2005).

Worry can be measured by trait questionnaires as well as by ecological momentary assessment methods that measure state worry. The most frequently used trait questionnaires are the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) and the Worry Domains Questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992). The PSWQ is often used to measure pathogenic aspects of worry, for example its uncontrollability. Several studies that have been important in developing and testing theoretical models of GAD have used the PSWQ, for example to link pathological worry to potentially pathogenic phenomena and processes such as negative mood and ‘stop rules’ (Startup & Davey, 2003; Davey & Levy, 1998), intolerance of uncertainty (Dugas, Gagnon, Ladouceur, & Freeston, 1998) and meta-worry (Wells & Carter, 2001). Moreover, the PSWQ has been used as an outcome measure in several studies evaluating the efficacy of cognitive-behavioral therapies (Borkovec & Costello, 1993; Borkovec, Newman, Pincus, & Lytle, 2002; Dugas et al., 2003) and pharmacological treatments for GAD (Mogg, Bradley, Baldwin, & Brodrick, 2004). Whereas the PSWQ is a measure of pathogenic worry and the worry process, the WDQ was developed to measure the content of worries. In contrast with the PSWQ, the WDQ has been found to tap into constructive worrying (Davey, 1993). The WDQ has proven useful to differentiate worry topics associated with anxious mood and depressive mood (Diefenbach et al., 2001). Furthermore, in studies concerned with the differences between worry and obsessive thoughts, the WDQ and its short form (Stöber & Joormann, 2001) have proven useful in helping participants identify their most worrisome thoughts (Langlois, Freeston, & Ladouceur, 2000b; Langlois, Freeston, & Ladouceur, 2000a; Lee, Lee, Kim, Kwon, & Telch, 2005).

Several studies have shown that both the PSWQ and the WDQ have promising psychometric properties (Brown, 2003; Davey, 1993; Meyer et al., 1990; Stöber, 1998). However, the hallmark of validity of trait questionnaires is the extent to which they predict the behavior they are supposed to
measure, that is, its frequency and its duration. This issue does not appear to be conclusively addressed for the PSWQ and the WDQ, as we will argue below. Also, it is important to know whether these trait worry questionnaires are better predictors of worry in daily life than the closely related and broadly used phenomenon of trait anxiety (Startup & Erickson, 2006). Finally, it is also essential to know whether the clinically used PSWQ predicts potentially pathogenic aspects of worry in daily life better than the WDQ, for example the perseverance of worry during several days and the continuation of daily worry into the night.

The first validation study of the PSWQ showed that subjects scoring high on the PSWQ estimated that they had spent more time worrying per day during the past week than those scoring in the middle or low range (Meyer et al., 1990). In contrast, in a study with GAD patients, the PSWQ did not significantly correlate with estimates of the percentage of time spent worrying per day during the past month (Brown, Antony, & Barlow, 1992). However, Dupuy et al. (2001), using daily measurements for fourteen days, found that PSWQ scores predicted worry duration \((r = .59)\) in a group of healthy participants and in a group of participants diagnosed with GAD \((r = .42)\). Nevertheless, recent research has shown that pathological worry as observed in GAD patients and normal worry as observed in, for example, healthy students are not separate phenomena but mainly differ in severity, particularly its frequency and duration (Ruscio, Borkovec, & Ruscio, 2001). Therefore, it is important to examine to what extent trait worry questionnaires predict worry on this full severity range. Furthermore, the latter study did not differentiate between the frequency and the duration of worry, while it seems that worry duration is more pathogenic than worry frequency. According to Davey (2006, p. 218): “dysfunctional perseveration is one of the critical defining features of pathological worry”. Short worry episodes may reflect successful problem solving while longer worry episodes may imply potentially pathogenic processes. Duration of worry, and not or much less so frequency, predicted negative health outcomes (Brosschot & Van Der Doef, 2006), and mediated the effects of daily stress on heart activity during subsequent nocturnal sleep (Brosschot, van Dijk, & Thayer, 2007). Only two other diary studies have looked at correlations between the PSWQ and worry frequency as well as worry duration. Szábo and Lovibond (2002) found that the PSWQ predicted worry frequency \((r=0.48)\) during seven days, but not worry duration. In contrast, Brosschot and van der Doef (2006) found that in high school students the PSWQ predicted worry frequency \((r = 0.37)\) and worry duration \((r = 0.37)\) during six days. To our knowledge, no studies have investigated the predictability of worry in daily life by the WDQ. Surprisingly, none of these studies differentiated between daily worry and evening/nightly worry, although a study by Tallis, Davey and Capuzzo (1994) showed that most worrying in students takes place between 9 p.m. and 3 p.m. Furthermore, worry at night is an often reported complaint of people suffering from insomnia.
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(Harvey, Tang, & Browning, 2005) and GAD (Belanger, Morin, Langlois, & Ladouceur, 2004). Also, it has been suggested to be a predictor of adverse cardiac activity patterns during sleep (Brosschot et al., 2007; Hall et al., 2004).

In short, it has not been shown whether these two broadly used tests of trait worry predict actual worry, whether they do this better than trait anxiety, or whether the PSWQ is better at predicting perseverative (i.e. pathogenic) aspects of worry than the WDQ. These issues were addressed in this study, which is the first to do this by using momentary assessment to investigate worry frequency and duration in the daytime as well as the night-time. In this study we defined the perseverative aspects of worry not only as the prolongation (duration) of individual worry episodes, but also in an exploratory way, as (a) the persistence of daytime worry into the night-time, (b) the persistence of worry into the following day(s), and (c) the total number of days and nights that people reported worrying over the six days. The latter is in line with the DSM-IV that states that a defining feature of pathological worry is that it occurs “more days than not, for at least 6 months” (APA, 2001).

Method

Participants

The sample consisted of 432 first year psychology students. Eighty one percent of the sample was female and 19% was male. The mean age was 21, with a minimum of 17 and a maximum of 59 years. Data were obtained during obligatory courses that were taught during the second semesters of four successive years (1999-2002). Five hundred and eighteen students were invited to participate, however 16.6% of these failed to return their worry logs. Students received course credit for partaking in this course.

Instruments

Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990; Dutch translation: van Rijsoort, Emmelkamp, & Vervaeke, 1999). This questionnaire consists of 16 self-report items. Items are directed at the excessiveness, duration and uncontrollability of worry as experienced in clients diagnosed with GAD, for example: “Once I start worrying, I can’t stop”. The PSWQ has demonstrated high reliability as well as high temporal stability and substantial validity in the assessment of trait worry (Meyer et al., 1990; van Rijsoort et al., 1999).
**Worry Domains Questionnaire** (WDQ; Tallis et al., 1992; Dutch translation: van Rijsoort et al., 1999). The Worry Domains Questionnaire (WDQ) was administered to assess the content and amount of worry. It consists of 25 items that make up the following five subscales: Relationships (e.g., “that I will lose close friends”), Lack of Confidence (e.g., “that I lack confidence”), Aimless Future (e.g., “that I’ll never achieve my ambitions”), Work Incompetence (e.g., “that I will not keep my workload up to date”), and Financial (e.g., “that I’m not able to afford things”). Internal reliability (van Rijsoort et al., 1999) and 4-week retest reliability of the total score and all subscales are satisfactory (Stöber, 1998).

**State Trait Anxiety Inventory-Trait Form** (STAI-T; Dutch version: van der Ploeg, Defares, & Spielberger, 1980). To measure trait anxiety we administered the trait version of the State-Trait Anxiety Inventory. The STAI-T is a questionnaire that measures the participants’ predisposition to anxiety and has often been used in studies evaluating the effectiveness of treatments for GAD (Fisher & Durham, 1999). It consists of 20 self-report items and earlier use has shown good internal consistency and validity (van der Ploeg et al., 1980).

**Worry log.** The worry log is a one-page A4 form that has previously been used in a study by Brosschot and van der Doef (2006; see the Appendix for an example). On this form an adapted version of Borkovec’s et al.’s (1983) working definition of worry was given (see below). All participants were instructed to register their worries during 6 days by tallying each worry episode. More specifically, they were instructed to register a worry episode whenever they noticed that they were worrying, or immediately after they had been worrying. At the end of each day they were asked to estimate the total number of worry episodes (*daily worry frequency*) and the total *duration* of these episodes (in minutes), based on their tallies. Each morning, they were requested to estimate the frequency and total duration of any nightly worry episodes (*worry frequency and duration in the night-time*).

To operationalize perseveration of worry, three additional and exploratory **worry perseveration indices** were calculated: (a) the persistence of daytime worry into the night-time, (b) the persistence of worry into the following day(s) and (c) the total number of days and nights that participants worried. These perseveration indices were calculated as follows. For each day and night, the data from the worry log were recoded into dummy variables that indicated whether participants had been worrying (‘1’) or not at all (‘0’). The total number of days and nights that people had been worrying were summed to obtain (c). The dummy variables for the daytime and night-time for each day were added up. A score of 1 was given for daytime and night-time worrying respectively. These scores were added up per day, whereby a score of 2 indicates perseveration of worrying into the night. By counting the total number of perseveration scores we obtained (a). Likewise, the
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Persistence of worry into the following day(s) (b) was calculated by counting perseveration scores for every two consecutive days and nights.

Procedure
The experiment consisted of two group sessions, with an interval of two weeks between them. During the first session the participants completed the questionnaires and received instructions concerning the registration of worry. These instructions were also printed on the back of the worry log. More precisely, they were told that (after the working definition of Borkovec et al., 1983):

‘worrying involves thinking about a subject that has or can have negative consequences for you, and for which there is no, or not yet, a solution; it often, but not always, consists of a chain of negative thoughts, about the same or different topics, and often concerns something in the future, and the thought often takes shape as ‘Imagine that . . . ’ or ‘What would happen if . . . ?’; The same thoughts often return; when you are engaged in worrying it is difficult to stop or hold. It definitely occupies your mind, and it is often ‘disturbing and intensive.’ Participants were urged to conform their idea of worry as much as possible to this definition.

At the second group session the participants returned their worry logs and were debriefed.

Statistical analyses
The predictability of worry duration, worry frequency and worry perseveration by trait questionnaires was analyzed with Pearson correlations, hierarchical, and forced entry regression analyses. The distributions of worry duration, worry frequency and worry perseveration (i.e. number of days and nights worrying and number of successive days worrying) were significantly skewed and were transformed into normal distributions using logarithmic transformations. When describing the data (see section 3.1 and table 1), we report the untransformed data. All data were analyzed using the SPSS 11.0 software package.

Results
Descriptive statistics
Table 1 shows the descriptive statistics of the most important variables in this study. On average, participants worried 28 minutes: 22.5 minutes during the daytime, and 5.5 minutes during the nighttime. On average, participants worried during 4.69 days (S.D. = 1.62) and 1.93 nights (S.D. = 1.87). Only 2% of the participants indicated that they had not been worrying at all during the six registration days and nights. Thirty-nine participants scored above the suggested clinical cut-point of
62 on the PSWQ (Behar, Alcaine, Zuellig, & Borkovec, 2003). On average, these participants worried 61.81 minutes a day (S.D. = 48.39).

The trait questionnaires showed satisfactory levels of internal consistency (Cronbach’s α: PSWQ = .93, WDQ = .90, STAI-T = .90). The mean scores on the PSWQ (M = 43.51; S.D. = 12.97), the WDQ (M = 21.41; S.D. = 14.71) and the STAI-T (M = 37.45; S.D. = 8.77) are within the normal range for healthy subjects and are comparable with mean scores found in other studies using young adults (Brosschot & van der Doef, 2006; Tallis et al., 1994).

The participants that did not return their worry logs did not differ significantly from those who did return their logs on the PSWQ, WDQ and STAI-T. In line with earlier studies on gender differences in worry (Robichaud, Dugas, & Conway, 2003), women scored significantly higher than men on all worry and anxiety variables.

Table 1. Descriptive statistics of worry episodes and trait questionnaires

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worry duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28.04</td>
<td>41.62</td>
<td>0.00</td>
<td>524.33</td>
</tr>
<tr>
<td>Daytime</td>
<td>22.51</td>
<td>35.61</td>
<td>0.00</td>
<td>481.67</td>
</tr>
<tr>
<td>Night-time</td>
<td>5.52</td>
<td>9.42</td>
<td>0.00</td>
<td>72.50</td>
</tr>
<tr>
<td>Worry frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.55</td>
<td>3.81</td>
<td>0.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Daytime</td>
<td>3.01</td>
<td>3.35</td>
<td>0.00</td>
<td>29.17</td>
</tr>
<tr>
<td>Night-time</td>
<td>0.54</td>
<td>0.84</td>
<td>0.00</td>
<td>7.50</td>
</tr>
<tr>
<td>PSWQ</td>
<td>43.51</td>
<td>12.97</td>
<td>16.00</td>
<td>78.00</td>
</tr>
<tr>
<td>WDQ</td>
<td>21.41</td>
<td>14.71</td>
<td>0.00</td>
<td>82.00</td>
</tr>
<tr>
<td>STAI-T</td>
<td>37.45</td>
<td>8.77</td>
<td>21.00</td>
<td>66.00</td>
</tr>
</tbody>
</table>

Note. PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; STAI-T = State Trait Anxiety Inventory-Trait version.

Prediction of worry duration and frequency by trait questionnaires

Pearson correlations between trait questionnaires and worry duration and worry frequency are shown in Table 2. Total worry duration correlated moderately with the PSWQ (r = .49, p < .01), the WDQ (r = .41, p < .01) and the STAI-T (r = .43, p < .01). In addition, total worry frequency correlated moderately with the PSWQ (r = .44, p < .01), the WDQ (r = .41, p < .01) and the STAI-T (r = .43, p < .01). To examine the extent to which trait worry questionnaires independently predict worry duration and frequency, forced entry regression analyses were conducted (see Table 3 for results). Total worry
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duration was best predicted, \( R^2 = .26; F(3, 372) = 43.10, p<.001 \), by the trait worry questionnaires, the PSWQ, \( \beta = .33, p<.01 \), and the WDQ, \( \beta = .14, p<.05 \), but not by the STAI-T, \( \beta = .10, \text{ns} \). Total worry frequency was best predicted \( R^2 = .23; F(3, 383) = 38.36, p<.001 \) by the PSWQ \( \beta = .20, p<.01 \), the WDQ \( \beta = .19, p<.01 \) and the STAI-T \( \beta = .16, p<.05 \) together.

Table 2. Pearson correlations of trait questionnaires and worry in daily life

<table>
<thead>
<tr>
<th></th>
<th>Worry duration</th>
<th>Worry frequency</th>
<th>PSWQ</th>
<th>WDQ</th>
<th>STAI-T</th>
</tr>
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<tr>
<td>Worry duration</td>
<td>-</td>
<td></td>
<td>.49</td>
<td>.44</td>
<td>-</td>
</tr>
<tr>
<td>Worry frequency</td>
<td>.73</td>
<td>-.</td>
<td>.41</td>
<td>.41</td>
<td>.63</td>
</tr>
<tr>
<td>PSWQ</td>
<td>.64</td>
<td>.43</td>
<td>.64</td>
<td>.64</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. All correlations are significant at the 0.001 level (2-tailed). PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; STAI-T = State Trait Anxiety Inventory-Trait version.

Table 3. Forced entry regression analysis of worry in daily life

<table>
<thead>
<tr>
<th>Measure</th>
<th>Total worry duration ( \beta )</th>
<th>( p )</th>
<th>( R^2 )</th>
<th>( F )</th>
<th>Total worry frequency ( \beta )</th>
<th>( p )</th>
<th>( R^2 )</th>
<th>( F )</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSWQ</td>
<td>.33</td>
<td>.000</td>
<td>.26</td>
<td>43.10</td>
<td>.20</td>
<td>.005</td>
<td>.23</td>
<td>38.36</td>
</tr>
<tr>
<td>STAI-T</td>
<td>.10</td>
<td>.195</td>
<td>.10</td>
<td>.16</td>
<td>.050</td>
<td>.050</td>
<td>.10</td>
<td>.050</td>
</tr>
</tbody>
</table>

Note. PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; STAI-T = State Trait Anxiety Inventory-Trait version.

Specific prediction of night-time worry

To assess which trait questionnaire specifically, and exclusively, predicted worry in the night-time independent of worry in the daytime, a hierarchical regression analysis was conducted. Daytime worry was entered in the analysis in the first block and the three trait questionnaires were entered in the second block. Results are shown in table 4. After controlling for daytime worry, only the PSWQ predicted worry duration \( (\beta = .18, p<.01) \) and worry frequency in the night-time \( (\beta = .14, p<.05) \).
Table 4. Hierarchical regression analysis of worry in the night-time

<table>
<thead>
<tr>
<th>Block</th>
<th>Measure</th>
<th>Worry duration night-time</th>
<th>Worry frequency night-time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>β</td>
<td>p</td>
</tr>
<tr>
<td>1</td>
<td>Worry Daytime³</td>
<td>.32</td>
<td>.182.85</td>
</tr>
<tr>
<td></td>
<td>Worry Daytime³</td>
<td>.47</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>PSWQ</td>
<td>.18</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>WDQ</td>
<td>.06</td>
<td>.271</td>
</tr>
<tr>
<td></td>
<td>STAI-T</td>
<td>-.03</td>
<td>.655</td>
</tr>
</tbody>
</table>

Note. PSWQ = Penn State Worry Questionnaire; WDQ = Worry Domains Questionnaire; STAI-T = State Trait Anxiety Inventory-Trait version. ³ Worry duration in the daytime was used to predict worry duration in the night-time, worry frequency in the daytime was used to predict worry frequency in the night-time.

Specific prediction of the perseveration of worry

The prediction that the PSWQ is a better predictor of the worry perseveration indices than the WDQ and the STAI-T was explored by conducting forced entry regression analyses. Number of nights worrying and number of days during which daily worry persisted into the night-time were only predicted by the PSWQ, (respectively β = .23 and β = .24, p’s< .01). Number of days worrying and number of days worrying in a row were predicted by the PSWQ, (respectively β = .23 and β = .19, p’s< .05), and the WDQ, (respectively β = .13 and β = .15, p’s< .05), although stronger by the former.

Discussion

This study is the first to investigate the predictive validity of the PSWQ and the WDQ, two widely used trait worry questionnaires, and the superiority of the PSWQ in predicting potential pathogenic worry. Collectively, the findings provide acceptable support for the predictive validity of these questionnaires and for the specific clinical applicability of the PSWQ. Furthermore, the study yielded descriptive data of normal daily worry, portraying worry as a very common phenomenon in non-clinical persons, with more days spent worrying than not.

The PSWQ and the WDQ both predicted worry duration and worry frequency in daily life, independent of each other and of trait anxiety. Together, the trait worry questionnaires accounted for approximately 24% of the variance of worry in daily life. This percentage is comparable with that found in other studies using momentary assessment of worry (Dupuy et al, 2001; Brosschot & van der Doef, 2006) and studies concerned with the prediction of daily negative affect by neuroticism.
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(Eid & Diener, 1999; Mroczek & Almeida, 2004). It is not very high, but may become higher when periods longer than six days are considered, making the state measurements less situationally determined. However, these figures also imply that the bulk of the daily experience of worry is not predicted by trait measures. This might be an issue to consider when investigating the outcomes of worry, since adverse health outcomes might be independently predicted by trait and state levels of negative emotional variables, such as has been shown for negative affect (Cohen et al., 1995; Tang & Gibson, 2005). It is possible that trait worry and state worry might reveal similar differential effects. At least one recent study showed that while trait worry was cross-sectionally associated with somatic health complaints, daily worry episodes predicted an increase in these complaints (Brosschot & van der Doef, 2006). Somewhat more indirect evidence comes from a GAD treatment study in which it was found that cognitive-behavioral therapy was effective in reducing worry as measured by the PSWQ, whereas applied relaxation therapy was specifically effective in reducing daily reports of anxiety (Borkovec & Costello, 1993). Thus, studies untangling the mechanisms whereby worry affects health should consider combining trait measures with momentary assessments of worry.

This study also provided support for the use of the PSWQ as a measure of pathogenic worry. We found that the PSWQ was a better predictor of total worry duration and frequency than the WDQ and the STAI-T. In addition, the PSWQ was the only trait measure that predicted worry at night. Night-time worry is often observed in insomnia (Harvey et al., 2005) and GAD (Belanger et al., 2004), and is believed to play a crucial etiological role in these disorders. Exploratory analysis showed that the PSWQ was the best predictor of worry perseveration as indexed by total number of days and nights spent worrying and the persistence of worry into the night and into the following days. Thus, the PSWQ and not the WDQ or trait anxiety predicted high levels of perseverative worry in daily life, as operationalized by various indices, including total duration, nocturnal worry, and persistence of worry across consecutive days and nights.

These findings have to be interpreted in the light of several methodological limitations. Our measurement of worry at night could have been prone to retrospective bias as participants were asked to register worry the following morning, instead of during the night, while they were worrying. It might be argued that especially high PSWQ scorers might have overestimated worry at night. On the other hand, overestimations of the time lying awake have been found in both healthy subjects and insomniacs (Nelson & Harvey, 2003; Baker, Maloney, & Driver, 1999), and might thus not be restricted to high PSWQ scorers. In addition, it remains unclear whether worry episodes at night took place while participants were actively engaged in activities or while they were passively lying in bed. Moreover, worry episodes at night could have occurred before or after participants had fallen asleep. This is a potential flaw that necessitates a more rigorous study that includes nocturnal momentary
assessments, although such a study will have to solve the problem of how to assess nocturnal worry without interfering with sleep. Furthermore, one could argue that the percentage of participants that did not return their worry logs was relatively large. However, this was comparable to that found in another study (Brosschot & van der Doef, 2006) and there were no differences between the studies on the scores on the trait questionnaires. In addition, the participants who did not return their worry logs did not differ on the scores on the trait questionnaires from those who did return their logs. Our sample therefore seemed to cover the full worry range. Another concern can be raised about our operationalization of pathological worry. We did not include a measure of GAD to assure whether worry was pathological as defined by the DSM-IV (APA, 1994). However, Ruscio (2002) showed that although high levels of worry are a main characteristic of GAD, a large group of people who show high levels of worry do not receive a full GAD diagnosis. In addition, several studies suggest that student samples are suitable to investigate worry on the full severity range (Borkovec & Roemer, 1995; Ruscio, 2002; Roemer, Borkovec, Posa, & Borkovec, 1995). Our interest was in the prediction of the perseveration of worry, indexed in a variety of ways and not in predicting diagnoses of GAD. Finally, the instructions given to participants need some consideration. Specifically, it is possible that our definition of worry as ‘uncontrollable’ and ‘often disturbing and intensive’ led to an under-reporting of episodes of ‘constructive worry’ (Davey, 1993). It is important to note that the superiority of the PSWQ in predicting worry in daily life is likely to be limited to pathological worry. In contrast, the finding of daily worry duration that was twice as long by Dupuy et al. (2001; 60 min versus 30 min by us and by the related study of Brosschot & Van der Doef, 2006) was possibly due to the fact that Dupuy et al. (2001) emphasized that worry was accompanied by anxiety, whereas the definition of worry that we provided laid more emphasis on worry as a process of repetitive negative thinking. The former definition could have led participants to report worry as well as anxiety episodes, thereby creating a bias in total worry duration. In addition, Szábo and Lovibond (2002) provided their participants with no definition of worry and found that 11% of the worry episodes were actually rumination episodes. This short outline makes clear that it is essential to consider in great detail what one exactly wants to measure and how one instructs participants.

In sum, this study provides reasonable support for the predictive validity of both the PSWQ and the WDQ, their superiority in predicting daily worry over the STAI-T, and their differential predictive validity with respect to perseverative or pathogenic aspects of worry. However, this study also suggests that future studies concerned with the emotional and health outcomes of worry should consider combining trait questionnaires with momentary assessments.
Appendix. Example of the worry log (one day excerpt displayed).

REGISTRATION FORM

Register during daytime: Fill in at the end of the day:

Number of worry episodes (one tally for each episode)

Day 1

Estimated total number:
(None?: Fill in: 0)

Estimated total duration
(None?: Fill in: 0)

Worry episodes at night?: Number: and duration: