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## Patterns of Situational Appraisal in Experiences of Worry and Anxiety

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**Summary**—Three studies investigating differences in people's appraisals of worry and anxiety situations are presented. First, data from a study by Reizenzein and Spielhofer (1994) were reanalyzed. Second, two further studies were conducted to replicate the findings of the reanalysis and to explore whether any additional appraisal dimensions were relevant for a differentiation of worry and anxiety situations. In sum, results showed that appraisals associated with situations in which worry and anxiety were experienced differed on eight appraisal dimensions. Compared to experiences of anxiety, experiences of worry were more often associated with positive self-evaluation, positive social-relationship evaluation, feelings of closeness, and sentiments of importance, and less often associated with feelings of inferiority. Moreover, in worry experiences, focus was often not on the self, but on other persons. Finally, with respect to temporal dimensions, worry situations were less often associated with notions of suddenness and momentariness than anxiety situations. Implications of these findings are discussed with respect to models of emotional appraisal and research on worry and generalized anxiety disorder.

**Keywords:** Anxiety, worry, generalized anxiety disorder, appraisal models of emotion

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## Introduction

With the publication of the third, revised edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987), generalized anxiety disorder (GAD) became an independent diagnostic category within the canon of anxiety disorders. The cardinal criterion for a diagnosis of GAD was chronic, excessive, and uncontrollable worry. Whereas anxiety was held to be common to all anxiety disorders, worry was specific to GAD. Thus, the DSM-III-R established worry as an important differential criterion for clinical assessment. Prior to this, however, there was considerable debate about the value of differentiating worry from anxiety. Some investigators suggested that worry was merely the cognitive component of anxiety, meaning that a separate investigation of worry was, at best, unnecessary (e.g., O'Neill, 1985a, 1985b). Others suggested that worry showed characteristics different from anxiety, meaning that a separate investigation of worry was, at least, valuable (e.g., Borkovec, 1985; Borkovec, Robinson, Pruzinsky, & DePree, 1983). This debate has since died down. GAD was retained as an independent diagnostic category in the DSM-IV (American Psychiatric Association, 1994), and worry became a major research topic in its own right (for a recent review, see Borkovec, Ray, & Stöber, 1998).

Nevertheless, the question of exactly how worry differs from anxiety has remained largely unexplored, with only few studies focusing on this aspect. A potential reason for this may be that the two phenomena show considerable overlap on both the conceptual and the empirical level. The most frequently cited definition of worry is that of Borkovec et al. (1983), according to which "worry is a chain of thoughts and images, negatively affect-laden and relatively uncontrollable. The worry process represents an attempt to engage in mental problem solving on an issue whose outcome is uncertain but contains the possibility of one or more negative outcomes" (p. 10). Whereas this definition makes no direct reference to anxiety, other definitions do link worry to anxiety, describing worry as anticipatory anxiety (Butler & Mathews, 1987) or anxious apprehension (Barlow, 1988). MacLeod, Williams, and Bekerian (1991) were thus able to summarize the common characteristics of worry definitions as follows: "Worry is a cognitive phenomenon; it is concerned with future events where there is uncertainty about the outcome, the future being thought about is a negative one, and this is accompanied by feelings of anxiety" (p. 478). The most frequently cited definition of anxiety is that of Spielberger (1972), according to which "the term 'anxiety' is perhaps most commonly used in contemporary psychology to denote a palpable but transitory emotional state or condition characterized by feelings of tension and apprehension and heightened autonomic nervous system activity" (p. 24). Whereas, in this definition, it is not entirely clear that the term "apprehension" denotes

worry, later definitions of anxiety have been more explicit in this regard. In Krohne's (1996) comprehensive review of anxiety research, anxiety is defined as "an affective state of the organism, characterized by heightened activity of the autonomous nervous system as well as self-perception of arousal, the feeling of tenseness, the experience of threat, and increased worry" (p. 8; own translation). With definitions of worry making reference to anxiety and vice versa, it comes as no surprise that there is also substantial overlap between the two phenomena on the empirical level. Measures of worry and anxiety have shown to be closely related across empirical studies, with correlations usually in the range of .50 to .80 (e.g., Meyer, Miller, Metzger, & Borkovec, 1990; Tallis, Eysenck, & Mathews, 1992).

Nevertheless, there is a growing body of findings indicating that, despite apparent conceptual and empirical overlap, worry and anxiety can be differentiated. This was first shown by Davey and associates, who demonstrated that worry and anxiety displayed different correlation patterns once the substantial overlap between the respective measures was controlled for (Davey, 1993; Davey, Hampton, Farrell, & Davidson, 1992). In their studies, Davey et al. presented participants with measures of habitual worry, trait anxiety, and ways of coping. In line with previous findings, worry and anxiety were highly correlated. Furthermore, both showed negative zero-order correlations with adaptive ways of coping. However, when partial correlations were computed to control for the overlap between worry and anxiety, a different pattern emerged: while anxiety still displayed negative correlations with adaptive ways of coping, worry now displayed positive correlations with problem-focused coping, affective regulation, and active cognitive and behavioral coping. Davey et al.'s seminal findings demonstrated that—once the considerable overlap between worry and anxiety has been taken into account—self-reports of worry and anxiety show specific characteristics and unique relationships which may go undetected when zero-order correlations only are inspected. Thus, as also shown by other research groups (e.g., Nitschke, Heller, Imig, McDonald, & Miller, 2001; Stöber & Joormann, 2001), it is indeed possible to differentiate between worry and anxiety when the overlap between the two concepts is statistically controlled for.

The aim of the present research was to further investigate potential differences between worry and anxiety, but by taking a different approach. Instead of investigating correlations associated with self-report measures of worry and anxiety, we examined situational appraisals associated with situations in which participants had experienced worry and anxiety. Applying methods from cognitive emotion research, we investigated whether or not situations in which worry was experienced (worry situations) were associated with different patterns of appraisal than situations in which anxiety was experienced (anxiety situations). According to cognitive theories of emotions, ap-

appraisals play a crucial role in all emotional experiences. Specifically, such theories hold that (a) different emotions are associated with specific appraisals, (b) these appraisals are "composed" of a limited number of features, and (c) these features can be organized into a limited number of dimensions (e.g., Frijda, 1986; Orthon, Clore, & Collins, 1988; Scherer, 1988; for a comprehensive review, see Reisenzein & Hofmann, 1990). Consequently, if worry and anxiety constitute different emotional experiences, they should show different patterns of appraisal.

As yet, however, only two studies on emotional appraisal have included both worry and anxiety. Moreover, neither study provides clear evidence about the potential differences between the two. The first study (Scherer, 1993) combined worry and anxiety in a single emotion category "anxiety/worry" and thus did not provide separate appraisal patterns for the two phenomena. The second study (Reisenzein & Spielhofer, 1994, Study 3) did investigate worry and anxiety separately. However, the authors provided only summary information that was too aggregated to allow for a detailed comparison of worry and anxiety (see pp. 60-61).<sup>1</sup> Therefore, in Study 1, we first re-analyzed Reisenzein and Spielhofer's (1994) worry and anxiety data. Then, in Study 2, we explored whether any additional appraisal dimensions showing differences between worry and anxiety situations could be identified. Finally, in Study 3, we aimed at a replication of the Study 1 findings, including two additional appraisal dimensions that had emerged from the results of Study 2.<sup>2</sup>

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<sup>1</sup>Reisenzein and Spielhofer translated the German emotion term *Besorgnis* with "apprehension." The more common translation of *Besorgnis*, however, is "worry" (Krohne, 1996; Schwarzer, 1993; Stöber, 1995). Consequently, we will use "worry" throughout this article when referring to Reisenzein and Spielhofer's findings on "apprehension."

<sup>2</sup>As one anonymous reviewer pointed out, there are different approaches to the question of how to demonstrate differences between certain emotions: approaches based on covariations between situational appraisals (using continuous rating scales) and approaches based on patterns of situational appraisals (using nominal rating scales). Both approaches have produced cumulative and valuable evidence to research on emotions, and ideally should complement one another. Still, in line with the previous studies including worry and anxiety (Reisenzein & Spielhofer, 1994; Scherer, 1993), we will concentrate on the second type of approach.

## Study 1

### *Method*

In their study, Reizenzein and Spielhofer (1994) recruited a sample of 30 participants, all of them students at the University of Vienna and native German speakers. For each of 30 different emotions (including worry and anxiety), participants were asked to recall an episode in which they had personally experienced the respective emotion. The recalled emotional situations were noted down in form of a short key phrase. Afterwards, each situation was re-presented to the participants, with the key phrase as a reminder. Participants were instructed to revisualize the situation in question, and then to indicate their appraisal of the situation using 22 nominal rating scales. Each rating scale consisted of three categories: the presence of an attribute (+); the absence of an attribute or, in case of bipolar dimensions, the presence of its opposite (–); and the statement "not applicable/neither-nor/irrelevant" (NA). The NA category was the same for each scale. All 22 scales are listed in the Appendix. (For further details on the appraisal dimensions, see Reizenzein & Spielhofer, 1994, pp. 67-74.)

Our reanalysis of the worry and anxiety data from Reizenzein and Spielhofer's study followed a three-step procedure. First, we calculated percentages of NA answers for the 22 appraisal dimensions to estimate the relevance of each dimension (relevance = 100% minus percentage of NA answers). Second, we calculated the frequencies of (+) and (–) answers for worry and anxiety separately. From these frequencies, we finally calculated the relative percentages of (+) answers for worry and anxiety, and tested the differences between these percentages for significance.

### *Results*

Of the 22 appraisal dimensions, six displayed a significant difference between worry and anxiety situations: self-evaluation, social-relationship evaluation, closeness, superiority, importance, and focus (see Table 1). Overall, the situations in which participants experienced worry (worry situations) received more favorable evaluations than the situations in which participants experienced anxiety (anxiety situations). First, self-evaluation was more often positive in experiences of worry than in experiences of anxiety. Moreover, all three social-relationship appraisals—social-relationship evaluation, closeness, and superiority—showed more positive endorsements for worry situations than for anxiety situations. In worry situations involving a social relationship, participants more often indicated that they felt close to another person or experienced a positive relationship with another person, and less often indicated

that they felt inferior, than in anxiety situations involving a social relationship. In addition, participants indicated that something important happened in almost all worry situations. The same can be said for only half of the anxiety situations. Finally, with respect to nonevaluative dimensions, only the appraisal of focus showed a significant difference between worry and anxiety situations. In most of the anxiety situations, focus was on the self. In most of the worry situations, it was on another person.

### *Discussion*

As outlined above, worry and anxiety are closely related and show some overlap on both the conceptual and the empirical level. Accordingly, our reanalysis of Reizenzein and Spielhofer's (1994) worry and anxiety data did not identify any differences in most of the 22 appraisal dimensions investigated. For six of the appraisal dimensions, however (self-evaluation, social-relationship evaluation, closeness, superiority, importance, and focus), there were marked differences between situations in which participants experienced worry (worry situations) and those in which they experienced anxiety (anxiety situations). Compared to anxiety situations, worry situations were more often associated with positive self-evaluations, positive social-relationship appraisals, feelings of closeness, and sentiments of importance, and less often with feelings of inferiority. Moreover, the focus in worry situations was often on others, whereas the focus in anxiety situations was almost exclusively on the self. In sum, the present findings suggest that the experience of worry may differ considerably from that of anxiety, particularly with respect to evaluative appraisals about the self and others (see General Discussion).

Although the differences we identified were substantial (with the exception of self-evaluation, all differences were significant with  $p < .01$ ), some questions remained open. First, due to the exploratory nature of this first study, no specific hypotheses were stated prior to data analysis. Some significant differences may therefore have resulted from inflation of alpha error associated with the large number of significance tests. Second, Reizenzein and Spielhofer's sample contained only 30 worry and 30 anxiety situations. With so few cases, statistical power was rather low, particularly for the appraisal dimensions with a high percentage of NA endorsements. Therefore, some differences may have gone undetected. Third, the 22 appraisal dimensions were only a subset of the 25 appraisal dimensions Reizenzein and associates had identified in their previous studies (Reizenzein & Hofmann, 1990, 1993; Reizenzein & Spielhofer, 1994, Study 1 and 2). Three dimensions had been discarded by Reizenzein and Spielhofer because they were found to be irrelevant for most of the emotions under examination. These previous studies did not include worry, however, and some of the discarded dimensions may in-

deed be relevant for the differentiation of worry and anxiety, while some of the retained dimensions may be irrelevant.

To address these questions, two further studies were conducted. The primary aim of Study 2 was to explore whether appraisal dimensions not included in Study 1 were relevant for worry and anxiety situations. A secondary aim was to explore whether any appraisal dimensions were irrelevant. The primary aim of Study 3 was to replicate the results from Study 1 with a larger number of worry and anxiety situations. A secondary aim was to explore if, with greater statistical power, further differences between worry and anxiety situations would emerge.

## **Study 2**

### *Method*

#### *Participants*

A sample of 20 participants (10 female) was recruited. To obtain greater variation in worry and anxiety situations and appraisal dimensions, we included both students (from the Free University of Berlin) and non-students (friends and acquaintances of the second author). Mean age was 30.1 years ( $SD = 4.8$ ). Students participated in exchange for two hours of extra course credit. All participants were native German speakers.

#### *Procedure*

Participants were interviewed individually. The interview and rating procedure closely followed the procedure that Reizenzein and Spielhofer (1994, Study 2) used to elicit appraisal dimensions. The interview consisted of two parts. In the first part, participants were asked to recall three situations in which they had experienced worry (but not anxiety) and three situations in which they had experienced anxiety (but not worry). The reason for including only "pure" situations was that—in analogy to the partial correlations applied by Davey et al. (1992; Davey, 1993)—we wanted to control for the overlap between worry and anxiety. The sequence of recollection of situations was balanced: Half of the participants first recollected worry situations and then anxiety situations; for the other half, the sequence was reversed. Each situation was condensed into a short key phrase (e.g., "Money problems" or "Walking home alone at night") which was written on a card to serve as a memory aid in the second part of the interview. In the second part, participants were presented with the nine possible paired combinations of the three worry and the three anxiety situations. The sequence of combinations was randomized. For each combination of one worry and one anxiety situation, participants were asked to gener-



ate an attribute in which the two situations differed. Overall, this procedure resulted in a total of 20 (participants)  $\times$  9 (attributes per participant) = 180 attributes.

### *Coding of Attributes*

The 180 attributes were independently coded by the authors, using Reizenzein and Spielhofer's (1994) coding system. This system comprised the 22 dimensions displayed in Table 1, as well as goal-conduciveness, difficulty, and interestingness (for a detailed description of all dimensions, see Reizenzein & Spielhofer, 1994, pp. 67-74). Although the 25 dimensions presumably comprised, either literally or in analogy, all dimensions mentioned in the literature on emotional appraisals, we also looked out for additional dimensions. To make full use of the data, we followed Reizenzein and Spielhofer's (1994) suggestion that complex, ambiguous, or otherwise problematic attributes could be given a second coding. This was the case for 31 attributes (17%). Congruent codings, either first or second choice, were obtained for 130 attributes (72%). To assess interrater agreement, chance-corrected agreement of our codings was computed separately for each category using conditional kappa (Hubert, 1977).<sup>3</sup> With an average kappa of .73, interrater agreement was satisfactory.

### *Results and Discussion*

First, we checked whether any of the 22 appraisal dimensions from Study 1 appeared to be irrelevant for the differentiation of worry and anxiety situations. A dimension was considered irrelevant if it did not receive a single coding from either rater. This was the case for two dimensions, namely certainty and anticipated effort. Next, we examined the codings for additional dimensions not included in Study 1. The only additional dimension given two congruent codings was goal-conduciveness. Moreover, close inspection of the attributes congruently coded as instability suggested that instability ratings in fact comprised two different aspects: the first aspect related to the *changeability* of the situation, corresponding to Reizenzein and Spielhofer's (1994) appraisal dimension of instability, while the second aspect related to the *duration* of the situation, corresponding to appraisals that whatever happened was either momentary or lasting. Consequently, we labeled this new appraisal dimension "momentariness."

The results of Study 2 suggested some changes to the set of appraisal dimensions applied in Study 1. First, as certainty and anticipated effort seemed

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<sup>3</sup>We would like to thank Rainer Reizenzein for valuable advice on the calculation of these statistics.

to be irrelevant to the differentiation of worry and anxiety situations, they could be excluded from further investigations, and goal-conduciveness included in their place. Moreover, in searching for additional differences between worry and anxiety situations, it would appear beneficial to include momentariness as a further dimension of temporal appraisal, as a complement to instability (for details on the two additional dimensions, see Appendix). Thus, the aim of Study 3 was twofold. First, we wanted to replicate the findings of Study 1. In line with these findings, we expected that, compared to anxiety situations, individuals in worry situations would indicate more positive self-evaluations and social-relationship evaluations (i.e., more positive social-relationship evaluation, more closeness, more superiority), that they would more often indicate sentiments of importance; and that the focus would less often be on the self. Second, we wanted to explore if, with a larger number of worry and anxiety situations, any additional appraisal dimensions (including goal-conduciveness and momentariness) would show differences between worry and anxiety situations.

### **Study 3**

#### ***Method***

##### ***Participants***

A sample of 41 students (32 female) was recruited at the Free University of Berlin. Mean age was 25.3 years ( $SD = 5.1$ ). Participants volunteered in exchange for one hour of extra course credit. All participants were native German speakers.

##### ***Procedure***

Participants were interviewed in individual sessions. Again, the interview consisted of two parts. In the first part, the procedure was exactly the same as in Study 2: participants were asked to recall three worry-only situations and three anxiety-only situations. For each situation, a key phrase was noted down on a card to serve as memory aid. In the second part, the six cards were put in random order. The key phrase from each card was then transferred to the top of a sheet containing the nominal rating scales for the 22 dimensions included (see Appendix). Participants were instructed to revisualize the situations they had experienced and then rate these situations (not the emotional experience) using the rating scales presented. Apart from the addition of goal conduciveness and momentariness and the omission of certainty and anticipated effort, the rating scales were the same as in Study 1. The statistical analyses also followed the

same procedure as in Study 1, with the exception that directional tests were computed for those dimensions for which hypotheses had been formulated.

### *Results*

As shown in Table 2, all hypotheses were confirmed. Situations in which participants experienced worry (worry situations) showed the predicted differences to situations in which participants experienced anxiety (anxiety situations) with respect to subjective evaluation, social-relationship evaluation, closeness, superiority, importance, and focus. As expected, experiences of worry were less often associated with negative self-evaluation than experiences of anxiety. Furthermore, experiences of worry were more often associated with closeness and a positive evaluation of the social-relationship involved in the situation, and less often with feelings of inferiority. Importance again showed significant differences: participants more often indicated sentiments of importance for worry situations than for anxiety situations. Finally, the hypothesis concerning focus also received strong support. Whereas in 90% of anxiety situations focus was on the self, focus in worry situations was more balanced. In half of the worry situations, focus was on the self, in the other half, it was on another person or others.

For the dimensions for which no hypothesis had been formulated, test statistics were subjected to Holm's improved Bonferroni correction (Holland & Copenhaver, 1988) in order to conserve an error level of .05 across the whole set of exploratory analyses. After this procedure, two dimensions showed significant differences, namely suddenness and momentariness, indicating that worry and anxiety situations also differ with respect to temporal aspects, with worry situations less often associated with suddenness and momentariness than anxiety situations.<sup>4</sup>

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<sup>4</sup>Strictly speaking, Fisher's exact test may not be appropriate for the present analyses (Bortz, Lienert, & Boehnke, 1990; Siegel & Castellan, 1988). As each participant contributed more than one rating, the data are probably not statistically independent. Therefore, we experimented with a different statistic in order to explore whether the findings remain stable when controlling for the potential interdependencies in the data. Because each of the 41 participants generated three worry and three anxiety episodes in this study (except for one participant who only generated two worry episodes, see Table 2), we could investigate the appropriateness of our results by aggregating endorsements across participants and then using pairwise *t* tests to test differences in the appraisal of worry and anxiety episodes as follows: First, for each appraisal dimension, endorsements of (+) were coded as +1, endorsements of (–) as –1, and endorsements of NA as 0. Second, for each participant, a value "degree of (+) endorsement" was calculated by aggregating across worry situations and across anxiety situations separately, resulting in a data set with (independent) participants as the unit of analysis. MEAN was chosen as the aggregate function here, so individual values ranged between –1 and +1, with positive values indicating more (+) than (–) en-

### *Discussion*

Whereas Study 3 corroborated all the findings of Study 1, it produced two additional findings, indicating that worry situations were significantly less often associated with appraisals of suddenness or momentariness than anxiety situations. Thus, experiences of worry and anxiety also appear to differ with respect to temporal appraisals (see General Discussion). We can only speculate as to why Study 1, the reanalysis of Reizenzein and Spielhofer's (1994) data, did not show these differences. With respect to the appraisal of momentariness, the reason is simply that Reizenzein and Spielhofer's study included appraisals of instability, but not of momentariness, and that only the latter differentiate between worry and anxiety situations. With respect to the appraisal of suddenness, however, Study 1 used the same rating scale as Study 3. Nevertheless, the results differed markedly. We see two possible reasons for this difference. The first is related to the fact that Reizenzein and Spielhofer sampled "normal" worry and anxiety situations, instructing their participants to "recall for each of the emotions an episode . . . where they had experienced the respective affect" (p. 35). Because experiences of worry are often associated with anxiety and vice versa, this may have resulted in some overlap between worry and anxiety situations, thus blurring potential differences in the appraisal of suddenness. In contrast, we sampled "pure" worry and anxiety situations (i.e., worry-without-anxiety situations and anxiety-without-worry situations). This may have had the intended result of enhancing the differentiation between worry and anxiety situations. The second potential reason is related to the fact that Study 3 was based on a larger sample of situations than Study 1 (i.e., 245 situations compared to 60 situations) so that, with greater statistical power, Study 3 was able to identify differences in the appraisal of suddenness.

### **General Discussion**

Worry and anxiety are closely related phenomena, showing considerable overlap on both the conceptual and the empirical level. Nevertheless, research has begun to carve out differences between worry and anxiety by looking for variables that show different patterns of associations for the two phenomena. In this spirit, the present article examined patterns of situational appraisal.

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dorsements, and negative values indicating more (–) than (+) endorsements. Third and finally, pairwise *t* tests were computed to test differences between participants' appraisals of worry and anxiety situations. The pattern of results was exactly the same as the pattern displayed in Table 2. Consequently, the fact that we used Fisher's exact test on situations that were not strictly independent does not seem to have any adverse impact on the results of Study 3.

Three studies were presented comparing the appraisal of situations in which individuals experienced worry (worry situations) with those of situations in which they experienced anxiety (anxiety situations). First, Reizenstein and Spielhofer's (1994) data were reanalyzed. Second, two further studies were conducted to replicate the findings of this reanalysis and to explore whether any additional appraisal dimensions were relevant for the differentiation of worry and anxiety. Overall, the results showed that for most dimensions of appraisal, worry and anxiety situations did not differ. Yet, for eight appraisal dimensions, there were marked differences. Five dimensions (self-evaluation, social-relationship evaluation, closeness, superiority, and importance) were evaluative appraisals. The other three dimensions (focus, suddenness, and momentariness) were nonevaluative appraisals. With respect to the direction of these differences, the findings converged to form the following pattern. Compared to experiences of anxiety, experiences of worry were more often associated with positive self-evaluations and positive social-relationship evaluations. Moreover, compared to experiences of anxiety, experiences of worry were more often associated with a feelings of closeness and less often with feelings inferiority. Importance was a further dimension in which appraisals differed: more worry situations than anxiety situations were associated with sentiments of importance. Finally, with respect to temporal aspects, experiences of worry were less often associated with appraisals of suddenness and momentariness than experiences of anxiety.

The present findings may have important implications for models on emotional appraisal and research on worry and generalized anxiety disorder. Where models of emotional appraisal are concerned, they may elucidate why Scherer's (1993) expert system, which was based on the theoretical profiles of his appraisal model (Scherer, 1988), experienced difficulties in predicting worry and anxiety. This expert system was programmed to compare a participant's appraisals with the appraisal profiles of Scherer's model and then guess which emotion the participant was thinking of. Overall, the hit ratio was impressive, averaging 78%. For the combined emotion category "anxiety/worry," however, it was only 14%. A comparison of Scherer's theoretical profiles with the present findings reveals that two of his specifications for anxiety/worry may be problematic. First, Scherer's model holds that anxiety/worry is associated with low suddenness. In contrast, our findings show that only worry situations were often given appraisals of low suddenness. For most anxiety situations, however, suddenness was indeed indicated. Second, Scherer's model holds that anxiety/worry is associated with a focus on the self.<sup>5</sup> In contrast, our findings show that only anxiety situations are predominantly associ-

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<sup>5</sup>In Scherer's (1988) terms: concern relevance = own body/self.

ated with a focus on the self. In worry situations, on the other hand, focus is often on others. Consequently, our findings suggest that Scherer's (1993) expert system may be improved by respecifying the appraisal profile for anxiety/worry or, better yet, including separate profiles for anxiety and worry.

Where research on worry and generalized anxiety disorder is concerned, the present findings add further evidence to the growing body of research demonstrating that worry and anxiety—albeit closely related—are separate constructs that show some marked differences (Davey, 1993; Davey et al., 1992; Nitschke et al., 2001; Stöber & Joormann, 2001). First, our findings show that worry may have more positive connotations than anxiety. Experiences of worry were significantly more often associated with positive self-evaluations than experiences of anxiety. Moreover, experiences of worry were more often associated with sentiments of importance. Whereas people may also experience anxiety in face of minor threats (e.g., a harmless spider), people only tend to worry about major threats to their physical and psychological well-being (e.g., job loss), that is, threats which may affect a number of goals, goals of importance, or goals which cannot be realized after the event (Tallis & Eysenck, 1994). Moreover, research has shown that many people hold positive beliefs about worrying, for example, that worrying helps analytical thinking, motivates, and prepares for problem solving (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994; Tallis, Davey, & Capuzzo, 1994). In fact, many people consider worrying itself to be some kind of anticipatory problem solving (Tallis et al., 1994). Moreover, worrying about something (e.g., your team's new project) or someone (e.g., a colleague who has felt depressed lately) may indicate that you are a conscientious and empathic person; and worrying about technological risks or about socio-political developments may be regarded as a demonstration of expertise (Schönplflug, 1989). Accordingly, the experience of worry is often associated with positive self-evaluation.

Second, the present findings lend further support to recent theoretical developments that stress the importance of taking interpersonal factors into account when investigating worry and generalized anxiety disorder (Borkovec et al., 1998). In the present analyses, major differences between worry and anxiety situations were found for the appraisal of social relationships (social-relationship evaluation, closeness, and superiority) and focus. In most anxiety situations with a social-relationship component, the respondent felt distant and/or inferior to another person, suggesting that these situations referred to incidents in which he or she was afraid of somebody. In contrast, in most worry situations with a social-relationship component, the respondent felt close and/or not inferior to another person, suggesting that these situations referred to incidents in which he or she was worrying about somebody. Whereas almost all anxiety situations were associated with a focus on the self, half of the worry situations were associated with a focus on another person. Thus, it

comes as no surprise that chronic worriers show elevated levels of empathic concern for others (Peasley, Molina, & Borkovec, 1994). In some cases, this concern may be so exaggerated that the chronic worriers become overly-nurturant and intrusive in their interpersonal relationships (Borkovec et al., 1998; Pincus & Borkovec, 1994).

Finally, our findings indicate that events which elicit worry may also display a different temporal pattern than those which elicit anxiety. In line with formulations of worry as "anticipatory anxiety" (Butler & Mathews, 1987), the present studies found that experiences of worry were less often associated with appraisals of suddenness and momentariness than those of anxiety. The difference for suddenness was particularly pronounced. Whereas the majority of anxiety situations contained an element of suddenness, the majority of worry situations did not. This finding may highlight another difference between anxiety and worry. Whereas anxiety may be a spontaneous experience elicited by sudden and immediate threats (e.g., a dog attacking), worry episodes are often associated with nonsudden and distal threats which the individual is aware of well in advance (e.g., end-of-term exams). A characteristic of worry is that it involves planning ahead for future events, constructing negative scenarios of the future, and ruminating about possible negative outcomes (Tallis & Eysenck, 1994). Consequently, many worry situations were appraised as lasting, whereas most anxiety situations were appraised as momentary, a finding well in line with Spielberger's (1972) definition that anxiety is mostly a transitory state.

While the present findings are in accordance with conceptual and empirical work on worry and anxiety, they have some potential limitations. To begin with, it remains unclear whether the findings on differences in temporal appraisals are generalizable to "normal" worry and anxiety situations. Because anxiety and worry are closely related, worry situations will usually contain some anxiety, and anxiety situations will usually contain some worry. The difference in suddenness and momentariness, however, was only found between "pure" anxiety and worry situations (i.e., worry situations without anxiety and anxiety situations without worry), whereas all other differences were also found in the reanalysis of Reizenstein and Spielhofer's (1994) anxiety and worry situations. Thus, the findings for suddenness and momentariness await replication with unrestricted worry and anxiety situations. Moreover, our statistical comparisons may impose some limitations on the current findings, since Fisher's exact test may not be appropriate for the present analyses. As each participant contributed more than one rating, the data are probably not statistically independent. However, due to the replication of the Study 1 findings, the alpha adjustment for the new findings in Study 3, and the supportive results of the collateral parametric computations (pairwise *t* tests), we feel reasonably confident that false-positive conclusions have been avoided. Still, fu-

ture studies may profit from using continuous rating scales to assess appraisals in worry and anxiety situations. This would permit parametric tests to be used for repeated measures. These tests would not only control for potential dependencies in the data, but provide greater statistical power for the detection of differences between worry and anxiety.

Moreover, whereas the findings clearly indicate that worry and anxiety situations are associated with different patterns of situational appraisal, the appraisal patterns were obtained by aggregating across many different situations. Consequently, the extent to which the findings are also representative of individual worry and anxiety situations remains unclear. Research on test anxiety has shown that worry about test performance and evaluation is a major domain of worries for university students (Zeidner, 1998). However, it may be difficult to apply the pattern of findings related to social-relationship appraisals (social-relationship evaluation, closeness, and superiority) and focus to worries related to one's own performance. For worry in test situations, focus will be mostly likely on the self, rather than on others or on social relationships. Students' worries are not restricted to tests and exams, however. Whereas research with free-recall measures of worry (Dugas, Freeston, Doucet, Lachance, & Ladouceur, 1995) demonstrated that most of the university students' worries pertained to their studies (with 60-75% of students reporting such worries), it also emerged that students worried a great deal about their finances (30-39%), their intimate relationships (30-34%), and their relationships with family or friends (12-25%). Thus, worries that involve social relationships with intimate partners, friends, or family also constitute a fair share of people's experiences of worry (see also Craske, Rapee, Jackel, & Barlow, 1989). Nevertheless, future research on situational appraisals in worry and anxiety may profit from categorizing the worry and anxiety situations generated by participants in order to take the possibility of domain-specific appraisal patterns into account.

Furthermore, critics may claim that the present findings only mirror lay-person's everyday concepts, and have no implications for the scientific investigation of worry and anxiety. Whereas this may be a valid concern for our findings on anxiety, it is not the case for worry. The reason for this is that the scientific investigation of worry is grounded on everyday conceptions of worry, whereas the investigation of anxiety may rely on further data. According to Lang (1985), the "data of anxiety" come from three general categories of measurable responses, namely (a) verbal reports of distress, (b) fear-related behavioral acts, and (c) patterns of visceral and somatic activation. Moreover, the prominent self-report measures of anxiety such as the Manifest Anxiety Scale (Taylor, 1953) and the State-Trait Anxiety Inventory (Spielberger, 1983) make little or no direct reference to the term "anxiety." Instead, they have participants answer questions across the whole range of cognitions, feelings, be-



haviors, and somatic/physiological reactions usually associated with the experience of anxiety. Worry, on the other hand, is a genuinely private event, and the data on worry are drawn exclusively from verbal self-reports (however, see Stöber, 1998). In the scientific investigation of generalized anxiety disorder (GAD), researchers usually apply the DSM-IV (American Psychiatric Association, 1994) and related interview schedules (e.g., Brown, DiNardo, & Barlow, 1994) to arrive at, or rule out, a diagnosis of GAD. Participants are asked to indicate how much they worry, whether they consider their worrying to be uncontrollable, and whether they feel that their worrying affects their everyday functioning and personal relationships. Moreover, the prominent self-report measures of worry such as the Penn State Worry Questionnaire (Meyer et al., 1990) and the Worry Domains Questionnaire (Tallis et al., 1992) are all based on direct references to the term "worry," with each item asking participants to give frequency, intensity, or typicality ratings for their worries. Thus, in both basic and applied settings, the scientific investigation of worry is reliant on participants' everyday conceptions of worry in much the same way as was the case in the studies described in the present paper.

Finally, the present studies all involved German-speaking participants and their appraisals of situations in which they had experienced "Besorgnis" (the German term for worry) or "Angst" (the German term for anxiety). As language plays an important role in the study of emotions (Wierzbicka, 1995), the question may arise as to whether the present findings are generalizable to other languages. Whereas this may be problematic for languages which do not share the same roots as German, we are confident that the present findings will be generalizable to other Indo-European languages, particularly to English. First, German and English are closely related (cf. the German term "Angst" and the English term "anxiety"). Moreover, all previous findings which our research group has obtained from German participants responding to German translations of English-language worry and anxiety questionnaires have produced results comparable to those obtained with English-speaking participants and the original questionnaires (e.g., Joormann & Stöber, 1997; Stöber, 1995, 1997, 1998; Stöber & Joormann, 2001; Stöber, Tepperwien, & Staak, 2000). However, for languages from groups other than the Indo-European family, such as the Asian languages, the generalizability of the present findings is questionable, as there may not be direct equivalents for the terms "worry" and "anxiety" (e.g., Imada, 1989). Therefore, in line with previous studies on the structure and dynamics of worry (Boehnke, Schwartz, Stromberg, & Sagiv, 1998), it may be a worthwhile endeavor for future research to attempt a cross-national replication of the present findings, thus affording an insight into the cross-language commonalities and language-related specifics of situational appraisals associated with worry and anxiety.

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Table 1  
*Appraisals of Worry and Anxiety Situations: Reanalysis of Data from Reisenzein and Spielhofer (1994)*

Appraisal dimensions	Category <sup>a</sup>		Relevance %	<i>f</i>				% of (+) ratings <sup>b</sup>		<i>p</i> <sup>c</sup>
				Worry		Anxiety		Worry	Anxiety	
	(+)	(-)		(+)	(-)	(+)	(-)			
<i>Evaluative dimensions</i>										
Subjective evaluation	Positive	Negative	95	4	24	0	29	14	0	.052
Interpersonal evaluation	Positive	Negative	67	5	15	5	15	25	25	1.000
Moral evaluation	Right	Wrong	50	6	11	4	9	31	35	1.000
Self-evaluation	Positive	Negative	52	9	7	2	13	56	13	.023*
Evaluation of others	Positive	Negative	45	9	6	5	7	60	42	.449
Social-relationship evaluation	Positive	Negative	58	22	2	5	6	92	46	.006**
Closeness	Close	Distant	88	22	8	5	18	73	22	< .001***
Superiority	Superior	Inferior	53	5	8	0	19	39	0	.006**
Importance	Important	Unimportant	100	28	2	17	13	93	57	.002**
<i>Nonevaluative dimensions</i>										
Focus	Self	Other(s)	88	4	22	25	2	15	93	< .001***
Time	Present	Future	80	19	6	17	6	74	76	1.000
Suddenness	Sudden	Not sudden	77	14	9	17	6	61	74	.530

(Table 1, continued)

Expectedness	Expected	Unexpected	82	5	20	5	19	20	21	1.000
Familiarity	Familiar	Unfamiliar	88	9	16	9	19	36	32	.780
Certainty	Certain	Uncertain	78	9	15	6	17	38	26	.534
Predictability of consequences	Predictable	Unpredictable	92	15	13	7	20	54	26	.054
Instability	Changeable	Not changeable	90	6	20	10	18	23	36	.379
Intentionality	Intended	Unintended	70	11	9	9	13	55	41	.537
Causality	Self	Else	67	3	16	8	13	16	38	.163
Controllability	Controllable	Uncontrollable	88	22	4	25	2	85	93	.420
Anticipated effort	High	Low	68	11	9	17	4	55	81	.100
Focality-Globality	Concrete	Unspecific	95	24	5	25	3	83	89	.706

*Note.* 30 participants generated a total of  $N = 60$  situations (30 worry situations and 30 anxiety situation). Each situation was rated on all 22 appraisal dimensions. % relevance = 100% – percentage of NA ratings.  $f$  = frequency.

<sup>a</sup>See Appendix for details. <sup>b</sup>Relative percentage of positive endorsements:  $f(+)$   $\times$  100 / [ $f(+)$  +  $f(-)$ ]. <sup>c</sup>Error probability of Fisher's exact test, two-tailed.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , two-tailed.

Table 2

*Appraisals of Worry and Anxiety Situations: Replication and Extension*

Appraisal dimensions <sup>a</sup>	Hypothesis	Relevance %	<i>f</i>				% of (+) ratings <sup>b</sup>		<i>p</i> <sup>c</sup>
			Worry		Anxiety		Worry	Anxiety	
			(+)	(-)	(+)	(-)			
<i>Evaluative dimensions</i>									
Subjective evaluation	—	91	11	100	11	100	10	10	1.000
Goal conduciveness	—	69	23	56	20	71	29	22	.295
Interpersonal evaluation	—	75	17	76	20	71	18	22	.589
Moral evaluation	—	58	17	59	16	49	22	25	.843
Self-evaluation	W > A	77	39	50	22	78	44	22	.001**
Evaluation of others	—	54	30	35	29	39	46	43	.729
Social-relationship evaluation	W > A	68	53	31	39	43	63	48	.031*
Closeness	W > A	71	43	42	30	60	51	33	.015*
Superiority	W > A	58	22	42	5	73	34	6	< .001***
Importance	W > A	91	111	4	92	17	97	84	.002**
<i>Nonevaluative dimensions</i>									
Focus	A > W	93	63	50	104	11	56	90	< .001***
Time	—	95	54	61	54	63	47	46	1.000
Suddenness	—	94	40	76	80	33	35	71	< .001 <sup>+</sup>

(Table 2, continued)

Expectedness	—	88	51	51	50	64	50	44	.413
Familiarity	—	91	48	63	37	75	43	33	.131
Predictability of consequences	—	93	36	78	35	78	32	31	1.000
Instability	—	93	72	47	68	40	61	63	.785
Momentariness	—	87	54	48	83	29	53	74	.002 <sup>+</sup>
Intentionality	—	86	24	79	25	83	23	23	1.000
Causality	—	85	43	59	62	45	42	58	.027
Controllability	—	91	31	76	19	97	29	16	.026
Focality-Globality	—	96	98	22	84	32	82	72	.121

*Note.* 41 participants generated a total of  $N = 245$  situations (122 worry situations, 123 anxiety situations). Each situation was rated on all 22 appraisal dimensions. Hypothesis:  $W > A$  = Worry situations with more (+) endorsements than anxiety situations,  $A > W$  = Anxiety situations with more (+) endorsements than worry situations. Relevance % = 100% – percentage of NA ratings.  $f$  = frequency.

<sup>a</sup>See Table 1 for (+) and (–) categories. Additional dimensions were goal conduciveness with *conducive* (+) vs. *hindrance* (–) and momentariness with *momentary* (+) vs. *lasting* (–). <sup>b</sup>Relative percentage of (+) ratings:  $f(+)/[f(+) + f(-)]$ . <sup>c</sup>Error probability of Fisher's exact test, one-tailed if hypothesis specified, two-tailed if no hypothesis specified.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , one-tailed. <sup>+</sup> $p < .05$ , two-tailed (Bonferroni-corrected).



## Appendix: The Nominal Rating Scales of Studies 1 and 3

### *Evaluative Dimensions*

- Subjective evaluation.* In this situation, something happens ... which is desirable/positive (+); which is undesirable/negative for me (-).
- \**Goal conduciveness.* In this situation, something happens ... which is conducive to my personal goals (+); which is a hindrance to my personal goals (-).
- Interpersonal evaluation.* In this situation, something happens ... which others would evaluate positively/approve of (+); which others would evaluate negatively/disapprove of (-).
- Moral evaluation.* In this situation, something happens ... which is right, fair, or deserved (+); which is wrong, unjust, or undeserved (-).
- Self-evaluation.* In this situation, ... I evaluate myself positively (+); I evaluate myself negatively (-).
- Evaluation of others.* In this situation, ... I evaluate another person/others positively (+); I evaluate another person/others negatively (-).
- Social-relationship evaluation.* In this situation, ... I have a positive relationship to another person/others (+); I have a negative relationship to another person/others (-).
- Closeness.* In this situation, ... I feel close to another person/others (+); I feel distant/separated from another person/others (-).
- Superiority.* In this situation, ... I feel superior to another person/others (+); I feel inferior to another person/others (-).
- Importance.* In this situation, ... something important happens (+); something unimportant happens (-).

### *Nonevaluative Dimensions*

- Focus.* In this situation, something happens ... which concerns primarily myself (+); which concerns primarily another person/others (-).
- Time.* This situation is concerned ... with something in the present/which has already happened (+); with something in the future/which has not yet happened (-).
- Suddenness.* In this situation, ... something occurs suddenly (+); this is not the case (-).
- Expectedness.* In this situation, something happens... which I expected (+); which I did not expect/was unexpected (-).
- Familiarity.* In this situation, something happens ... which is familiar/known (+); which is unfamiliar/unknown to me (-).
- +*Certainty.* This situation concerns something ... that I am certain will happen or has happened (+); that I am uncertain will happen or has happened (-).
- Predictability of consequences.* In this situation, something happens ... the consequences of which I can foresee/predict (+); the consequences of which I cannot foresee/predict (-).
- Instability.* In this situation, something happens ... which may change again (+); which is unlikely to change again (-).
- \**Momentariness.* In this situation, something happens ... which is momentary (+); which is lasting (-).

*Intentionality.* In this situation, something happens ... which I actively tried (or try) to bring about or to prevent (+); which I did not (or do not) actively try to bring about or to prevent (-).

*Causality.* In this situation, something happens ... which was caused primarily by myself (+); which was caused primarily by somebody or something else (-).

*Controllability.* In this situation, something happens ... which I can (still, or again) change or influence (+); which I cannot (or can no longer) change or influence (-).

<sup>+</sup>*Anticipated effort.* I will have to exert much effort to deal with this situation (+); I won't have to exert much effort to deal with this situation (-).

*Focality-Globality.* In this situation, ... my emotion is elicited by a concrete event (+); my emotion is elicited by unspecific things (-).

### *Note*

Except for *Momentariness*, all scales are from Reizenzein and Spielhofer (1994, pp. 67-74). Only the (+) and (-) categories are listed. The NA (not applicable) category was the same for all scales. <sup>+</sup>Scales used only in Study 1. \*Scales used only in Study 3. All other scales were used in both studies.