

An Evaluation of a Computerized Measure of Interpretation Bias in Generalized Anxiety
Disorder (GAD)

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ABSTRACT

An evaluation of a computerized measure of interpretation bias in generalized anxiety disorder (GAD)

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Theories suggest that individuals with generalized anxiety disorder (GAD) make threatening appraisals of ambiguous information related to health, finances, and relationships, among other domains. As a result, we have recently developed two parallel word-sentence association paradigm (WSAP) computer tasks designed to assess threat and benign interpretation biases relating to GAD worry. It was hypothesized that the GAD analogue group (i.e., individuals meeting diagnostic criteria by questionnaire) would endorse more threatening interpretations and fewer benign interpretations of ambiguous sentences relative to the non-GAD group (i.e., individuals not meeting diagnostic criteria by questionnaire) in WSAP Sets A and B. In the current study, 97 university students and community volunteers were randomly assigned to Set A ($n = 49$) or B ($n = 48$), and completed self-report measures of anxiety, worry, and related symptomatology. The results indicate that of those assigned to Set A, no differences were found between the GAD analogue ($n = 19$) and non-GAD group ($n = 30$) on tendency to endorse threat interpretations. Of those assigned to Set B, the GAD analogue group ($n = 17$) was significantly more likely to endorse an overall threat interpretation bias and specifically, to reject benign disambiguations than the non-GAD group ($n = 31$). No differences were found between the groups in either Set in the tendency to accept threatening disambiguations. More research is needed on the specific role of biases in the

etiology and treatment of GAD, and why Set A did not distinguish between the groups.

This study provides preliminary support for the use of word-sentence paradigms to assess, and possibly modify, threat interpretation biases in GAD.

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An Evaluation of a Computerized Measure of Interpretation Bias in Generalized Anxiety Disorder (GAD)

GAD and Interpretation Bias

Generalized anxiety disorder (GAD), characterized by uncontrollable and excessive worry about a number of situations, is one of the most common anxiety disorders and is associated with poor quality of life (Barrett & Oxman, 1988; Wells & Carter, 2001; Wittchen et al., 2002). Notwithstanding the development of effective cognitive-behavioural treatment (CBT) protocols (Dugas et al., 2003; Ladouceur et al., 2000), approximately 30% of affected individuals do not fully benefit from treatment. As a result, continued research is necessary for enhancing our understanding of GAD and the factors that maintain the disorder, and developing more effective treatments.

Cognitive theory suggests that individuals with anxiety, such as those with GAD, tend to make threatening appraisals of ambiguous information (e.g., MacLeod & Cohen, 1993; Mathews & MacLeod, 1985; McNally, 1996). Furthermore, despite high rates of comorbidity between GAD and depression (e.g., Moffitt et al., 2007), the empirical evidence suggests that a negative interpretation bias among anxious individuals cannot be attributed to depression alone; individuals with anxiety, with or without comorbid depression, demonstrate a threat interpretation bias (e.g., Lawson & MacLeod, 1999; Mogg, Bradbury & Bradley, 2006; Pury, 2002).

Various priming tasks and measures have been developed to assess the tendency of anxious individuals to endorse negative appraisals of ambiguous situations (e.g., homophone word tasks). These methodologies infer interpretative biases by presenting respondents with ambiguous items as the priming stimuli (e.g., words or sentences that

transmit both a positive/benign and negative/threatening interpretation), and assessing the degree to which these primes facilitate the processing of subsequently presented benign or threatening information. Research findings have consistently indicated that individuals with high levels of anxiety are more likely to selectively access the threatening rather than benign meanings compared to individuals with low levels of anxiety. For example, non-clinical studies have shown that individuals high in trait anxiety are more likely to negatively interpret potentially threatening ambiguous homophones (e.g., die/dye, war/wore) than individuals low in trait anxiety (Dalglish, 1994; Eysenck, MacLeod, & Mathews, 1987; Mogg, Bradley, Miller, & Potts, 1994). Similar findings have been observed in studies comparing participants with GAD to non-anxious controls (e.g., Mathews, Richards, & Eysenck, 1989; Mogg, Baldwin, Brodrick, & Bradley, 2004).

Evidently, anxious individuals demonstrate an information processing bias when presented with ambiguous situations by more frequently relating the situations to their negative rather than non-negative meanings (Hirsch & Mathews, 1997; MacLeod, 1990; MacLeod & Cohen, 1993; Ouimet, Gawronski, & Dozois, 2009; Richards & French, 1992). These biases have been implicated in the development and maintenance of GAD and may contribute to reduced treatment efficacy (MacLeod & Rutherford, 2004).

Although cognitive biases are explicitly targeted in treatment through the use of verbal challenge and strategic control over one's interpretations (e.g., cognitive restructuring), interpretation biases are likely maintained by more automatic processing of information and cues. Thus, biases are not always under volitional control or awareness. As such, CBT for GAD may be augmented by including a program designed to modify (i.e., reduce) individuals' relatively automatic threat interpretations.

Assessment of Interpretation Bias in Social Phobia

Like theories of GAD, cognitive theories of social phobia (SP) assert that socially anxious individuals interpret ambiguous (in this case, social) information negatively (e.g., Amir, Foa, & Coles, 1998; Murphy, Hirsch, Mathews, Smith, & Clark, 2007). The role of negative interpretative biases in the persistence of SP stimulated the development and validation of a Word-Sentence Association Paradigm (WSAP; Beard & Amir, 2008; 2009). The WSAP was developed as a novel measure of bias, presenting word primes prior to ambiguous sentences to examine the effects of priming pre-existing negative beliefs on interpretations. Respondents indicate whether threatening or benign words (e.g., “embarrassing” or “funny,” respectively) relate to subsequently presented ambiguous sentences concerning social contexts (e.g., “people laugh after something you said”).

To assess discriminant validity, the WSAP task was evaluated using a sample of individuals with varying levels of social anxiety (Beard & Amir, 2008). Interpretation biases were assessed using the WSAP for SP while severity of social anxiety was measured using the Social Phobia and Anxiety Inventory, Social Phobia subscale (SPAI-SP; Turner, Beidel, Dancu, & Stanley, 1989). The results demonstrated that social anxiety was negatively correlated with benign endorsement ($r = -.60, p < .001$) and positively correlated with threat endorsement ($r = .60, p < .001$). Socially anxious individuals were less likely to endorse benign meanings and more likely to endorse threat meanings of ambiguous stimuli in comparison to non-socially anxious individuals (Beard & Amir, 2008). These findings provide support for the use of the WSAP as a measure of interpretation bias among socially anxious individuals.

Modification of Interpretation Bias in Social Phobia

The WSAP has been included in an interpretation modification program (IMP) for SP. A recent study has provided support for the effects of the IMP in not only training socially anxious individuals to endorse more benign and less threatening interpretative biases, but also in reducing symptom severity. The study took place over the span of four weeks and included eight 10-minute sessions of either IMP training or an interpretation control condition (ICC) to which participants were randomly assigned. In the IMP condition, individuals received positive feedback (“you are correct!”) following benign interpretations and negative feedback (“you are incorrect!”) following threat interpretations. In the ICC, interpretations were not systematically modified as individuals received positive and negative feedback at an equal rate across endorsements of threat and benign interpretations (Beard & Amir, 2008).

The IMP and ICC groups did not differ statistically at pre-training in their interpretation style and SP symptom severity. At post-training, the IMP group showed a significantly larger decrease in threat interpretations and a significantly larger increase in benign interpretations compared to the ICC group. Additionally, at post-training, individuals in the IMP group reported significantly fewer SP symptoms compared to those in the ICC group. These findings suggest that the use of systematic feedback to responses on the WSAP items has the potential to modify interpretation biases and reduce the severity of anxious symptomatology.

Assessment and Modification of Interpretation Bias in GAD

The evidence presents compelling support for the benefit of a word-sentence association paradigm for social phobia. Given the similarities in cognitive biases between

SP and GAD (Clark & Beck, 2010), there is reason to believe that a similar paradigm would be beneficial in assessing and modifying appraisal biases among individuals with generalized anxiety. The current research focused specifically on the assessment of bias in GAD.

Goals and Hypotheses

Our research group has developed two sets of parallel WSAP tasks with word-sentence pairs that relate to GAD worry domains (e.g., health of others, social relationships, finances; Davey, Hampton, Farrell, & Davidson, 1992; Dugas, Freeston, Doucet, Lachance, & Ladouceur, 1995). The current study aimed to examine the relation between self-reported GAD symptoms and the tendency to accept threatening and reject benign (i.e., non-threatening) interpretations in these two newly developed WSAP tasks. Specifically, the two main goals were to determine if: (1) individuals in the GAD analogue group (i.e., meeting GAD diagnostic criteria by questionnaire) would be more likely to accept threat interpretations and reject benign interpretations compared to those in the non-GAD group (i.e., not meeting GAD diagnostic criteria by questionnaire); and (2) whether differences between the GAD analogue group and the non-GAD group in interpretation biases would be found in both sets of the word-sentence association paradigm task.

The study had two main hypotheses: (1) the GAD analogue group would endorse a greater overall threat interpretation bias than the non-GAD group, and (2) the GAD analogue group would be more likely to (a) accept threat interpretations and (b) reject benign interpretations of ambiguous scenarios than the non-GAD group. As mentioned

above, the current study used two new parallel measures of interpretation bias; thus, hypotheses 1 and 2 were tested for each of the new measures.

Method

Participants

The sample consisted of 97 adults (75 women, 22 men) with a mean age of 23.91 years ($SD = 8.02$; range: 18-64). Additionally, 95.9% ($n = 93$) of the participants were full- or part-time students. The majority of participants reported their ethnicity as White or European (61.9%); 14.4% indicated Asian, 7.2% Black or African-Canadian, and 6.2% multi- or bi-racial. Most of the participants identified English as their primary language of use (62.9%); 17.5% indicated French, and 19.6% indicated “other” as their first language; all of the participants reported fluency in both reading and writing in English. (A copy of the sociodemographics form used in the study is presented in Appendix A).

Tables 1a and 1b summarize the demographic characteristics for the GAD analogue group and the non-GAD group in the samples assigned to the WSAP Set A and Set B, separately.

Table 1a (continued on the next page)

Descriptive Statistics of Demographic Variables in the GAD Analogue ($n = 19$) and Non-GAD Group ($n = 30$) Assigned to Set A of the WSAP

| Variable | Group | |
|----------|--------------------------|---------------------|
| | GAD analogue $M (SD)$ | Non-GAD $M (SD)$ |
| Age | 22.95 (5.98) | 22.53 (5.70) |

| Variable | GAD analogue <i>n</i> (%) | Non-GAD <i>n</i> (%) |
|------------------------|------------------------------|-------------------------|
| Female | 14 (73.7) | 19 (63.3) |
| Ethnicity | | |
| White/European | 10 (52.6) | 20 (66.7) |
| Asian | 3 (15.8) | 5 (16.7) |
| Black/African | 0 (0) | 2 (6.7) |
| Middle Eastern | 1 (5.3) | 0 (0) |
| Native | 0 (0) | 0 (0) |
| Bi-racial/multi-racial | 2 (10.5) | 3 (10) |
| Latin American | 3 (15.8) | 0 (0) |
| Other | 0 (0) | 0 (0) |
| First language | | |
| English | 13 (68.4) | 20 (66.7) |
| French | 2 (10.5) | 6 (20.0) |
| Other | 4 (21.1) | 4 (13.3) |
| Student | 19 (100) | 29 (96.7) |

Note. $N = 49$; GAD = Generalized Anxiety Disorder; WSAP = Word-Sentence Association Paradigm; no statistically significant differences between the groups, all $ps > .05$.

Table 1b (continued on the next page)

Descriptive Statistics of Demographic Variables in the GAD Analogue ($n = 17$) and Non-GAD Group ($n = 31$) Assigned to Set B of the WSAP

Group

| Variable | GAD analogue <i>M (SD)</i> | Non-GAD <i>M (SD)</i> |
|----------|-------------------------------|--------------------------|
| Age* | 22.13 (11.42) | 26.81 (4.28) |

| Variable | Group | |
|------------------------|------------------------------|-------------------------|
| | GAD analogue <i>n (%)</i> | Non-GAD <i>n (%)</i> |
| Female | 16 (94.1) | 26 (83.9) |
| Ethnicity | | |
| White/European | 10 (58.8) | 20 (64.5) |
| Asian | 2 (11.8) | 4 (12.9) |
| Black/African | 2 (11.8) | 3 (9.7) |
| Middle Eastern | 2 (11.8) | 2 (6.5) |
| Native Canadian | 0 (0) | 0 (0) |
| Bi-racial/multi-racial | 1 (5.9) | 0 (0) |
| Latin American | 0 (0) | 0 (0) |
| Other | 0 (0) | 2 (6.5) |
| First language | | |
| English | 9 (52.9) | 19 (61.3) |
| French | 3 (17.6) | 6 (19.4) |
| Other | 5 (29.4) | 6 (19.4) |
| Student* | 17 (100) | 28 (90.3) |

Note. $N = 48$; GAD = Generalized Anxiety Disorder; WSAP = Word-Sentence Association Paradigm.

*Statistically different, $p < .05$

Procedure

The Human Research Ethics Committee at Concordia University approved of the current study. The majority of participants were recruited through the Participant Pool of the Department of Psychology at Concordia (74.2%), and the rest were recruited through advertisements (25.8%). Poster ads were placed around Concordia's campus (see Appendix B for a copy of the poster advertisement), and Internet-based ads could be viewed, primarily, by students from another English-speaking university in the same city as well as by others in the community (see Appendix C for a copy of the content provided in the online advertisement). Interested individuals outside of the participant pool were instructed to contact the principal investigator via e-mail or telephone to schedule an appointment. Participants were told that the aim of the study was to examine the way in which individuals react to various situations by assessing the perceived association between words and sentences.

The study lasted approximately 45 minutes per participant, and all testing was carried out in the same location by the principal investigator. Participants were tested individually on a single occasion, between May and December 2011. They were accompanied to the testing room and were instructed to read about the study's purpose and procedure. Subsequently, they were asked to sign the consent form. Participants were aware that they were free to discontinue without explanation or penalty at any time. After consent was obtained, participants were taken to a computer room located beside the initial testing room. Copies of the participant consent forms for university students, and community volunteers are presented in Appendix D and E, respectively.

Participants were seated 30-40 centimetres from a computer screen (24.6 inches) and the experimenter read aloud the instructions that were displayed on the screen.

Participants were encouraged to ask questions about the task. Once they understood the instructions (including which response keys to use), the experimenter exited the computer room and participants began the task (the Word-Sentence Association Paradigm). These instructions and the opportunity for clarification were provided to each participant.

Half of the sample was randomly assigned to receive Set A of the computerized Word-Sentence Association Paradigm (WSAP) and the other half was assigned to receive Set B (see Appendix F and G for a copy of the stimuli in the WSAP Set A and Set B, respectively). After completing the computer task, which took approximately 10 minutes, participants returned to the initial testing room. They were then asked to complete the sociodemographics questionnaire, followed by a battery of questionnaires given in one of five quasi-counterbalanced orders to which they were randomly assigned. All participants received the same set of questionnaires, which included self-report measures of worry, anxiety and related constructs, as well as depressive symptomatology.

Following completion of the questionnaire package, participants completed Set A or Set B of the Stimulus Categorization Grid, which included pairs of ambiguous sentences and negative words. Participants assigned to Set A of the computerized WSAP received Set B of the categorization grid, and participants assigned to Set B of the WSAP received Set A of the categorization grid. For a copy of the categorization grids for Set A and Set B, see Appendix H and I, respectively (thorough analyses of the categorization grid items were not included in the current study). Next, participants were debriefed and informed of the true purpose of the study, which was to examine how individuals with high levels of worry and anxiety interpret ambiguous scenarios compared to individuals with low levels of worry and anxiety (A copy of the Debriefing form is presented in

Appendix J). Participants were then compensated for their participation in the form of a course credit for students recruited through the Participant Pool, and \$10 for community volunteers recruited through advertisements.

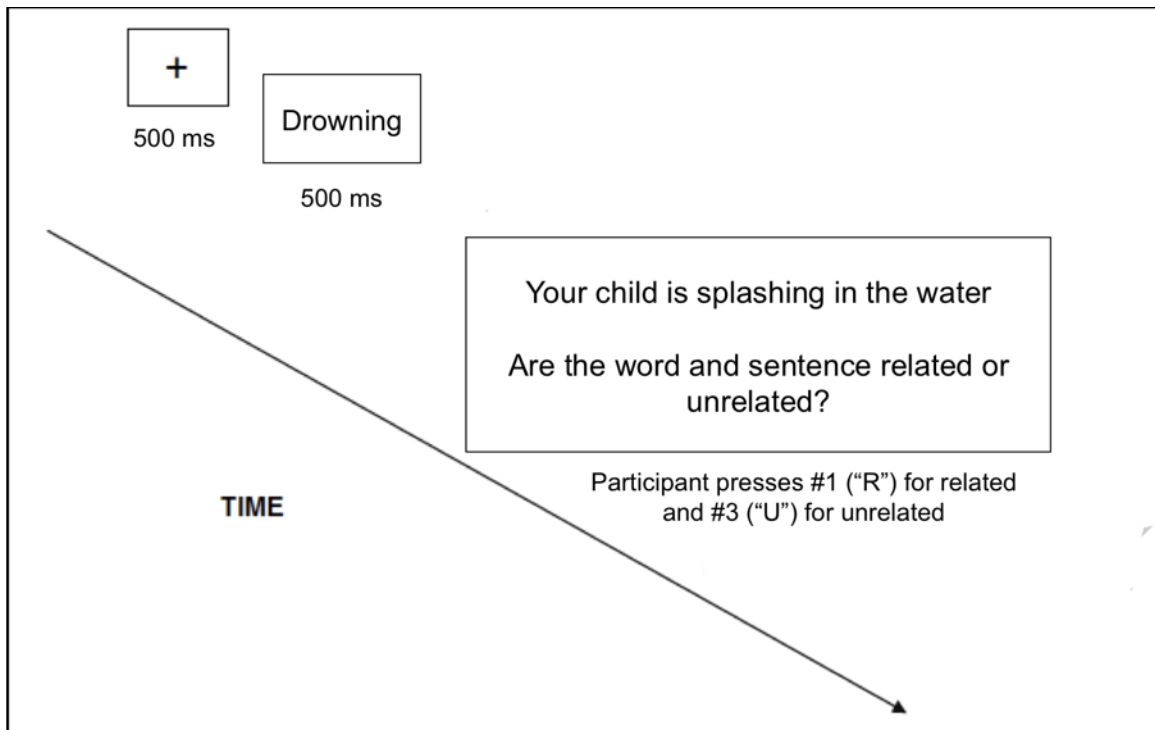
Measures

The *Word-Sentence Association Paradigm* (WSAP) Sets A and B for generalized anxiety disorder were modeled after the WSAP items for social phobia (see Beard & Amir, 2009), and were developed for this study. The computer-based WSAP for GAD was developed to assess interpretation style and specifically, the tendency to accept or reject threat and benign interpretations in individuals with GAD. The WSAP tasks were run on E-Prime 2.0 Professional version (by Psychology Software Tools, Inc., 2007). Each WSAP Set includes a total of 120 word-sentence pair trials. Each trial begins with a fixation point (+) that appears in the center of the screen for 500 milliseconds (ms); the fixation point is then replaced by a cue word that appears for 500 ms. The cue words represents either a threatening word (e.g., “blood”) or a benign word (e.g., “ketchup”). The word is then replaced by an ambiguous sentence in the center of the screen (e.g., “your shirt has red stains all over it”). Participants are then instructed to indicate as quickly and accurately as possible whether they think the word and sentence are related or unrelated. To indicate that the word and sentence are related, they are instructed to press the ‘1’ key on the keypad, which is marked with an “R” for Related. To indicate that the word and sentence are unrelated, participants are instructed to press the ‘3’ key on the keypad, which is marked with a “U” for Unrelated. All of the words and sentences appear in black, size 18, Arial font, on a grey background. Figure 1, below, illustrates an

example of a WSAP trial, including, the order and span of time in which the stimuli are presented.

Figure 1

An Example of a Word-Sentence Association Paradigm Trial



Note. This figure has been adapted from Beard & Amir (2009).

Each WSAP Set presents an equal number of threatening and benign words (60 of each) in 120 word-sentence pairs relating to the 10 worry domains. The domains include: health of self, health of others, physical harm to self, physical harm to others, social relationships, family relationships, romantic relationships, finances, academic performance, and work competence. These worry domains were selected based on the extant literature on normative and GAD worry (Davey et al., 1992; Dugas et al., 1995; Dugas et al., 1998). To control for order effects, the word-sentence pairs were presented

in a different random order across participants, as done in previous studies (e.g., Amir, Bomyea, & Beard, 2010; Amir, Weber, Beard, Bomyea, & Taylor, 2009).

The *Generalized Anxiety Disorder Questionnaire for the Diagnostic and Statistical Manual (4th Edition)* (GAD-Q-IV; Newman et al., 2002) is a 14-item self-report measure of generalized anxiety disorder based on the DSM-IV diagnostic criteria. The GAD-Q-IV was developed as a screening tool for GAD. Eleven of the items are rated dichotomously (Yes/No) and one item requires participants to list up to 6 worry topics. In addition, two items (interference and distress) are rated on a 9-point Likert scale, ranging from 0 (None) to 8 (Very severe). The recommended cut-off score of 5.7 out of 13, used in the current study, has been found to provide an optimal balance between sensitivity (83%) and specificity (89%) in identifying individuals who meet GAD diagnostic criteria. Additionally, there is evidence that GAD-Q-IV scores can distinguish individuals with GAD from individuals with panic disorder and social phobia. The GAD-Q-IV demonstrates good convergent and discriminant validity, inter-rater reliability using a structured diagnostic interview of GAD ($\kappa = .67$), and adequate test-retest reliability over two weeks ($r = .92$) (Newman et al., 2002). The GAD-Q-IV is presented in Appendix K.

The *Penn State Worry Questionnaire* (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990) is a 16-item self-report questionnaire that assesses chronic, excessive, and uncontrollable worry. Responses to items (e.g., “I am always worrying about something”) are indicated on a Likert scale from 1 (Not at all typical of me) to 5 (Very typical of me), with total scores ranging from 16 to 80. There is support for the measure’s convergent, divergent and discriminant validity in non-clinical and clinical populations

(e.g., Brown, Antony, & Barlow, 1992; Davey, 1993; Meyer et al., 1990; Molina & Borkovec, 1994). Furthermore, the PSWQ has been shown to have high internal consistency ($\alpha = .86$ to $.95$), and good test-retest reliability over four weeks ($r = .74$ to $.93$; Molina & Borkovec, 1994). The PSWQ is presented in Appendix L.

The *Intolerance of Uncertainty Scale* (IUS; Buhr & Dugas, 2002; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994) is a 27-item self-report measure of intolerance of uncertainty, which has been shown to be a distinguishing feature of GAD (Dugas & Robichaud, 2007; Ladouceur et al., 1999). The IUS assesses two negative beliefs about uncertainty: (1) that uncertainty has negative behavioural and self-referent implications; and (2) that uncertainty is unfair and spoils everything (Sexton & Dugas, 2009). Responses are rated on a Likert scale ranging from 1 (Not at all characteristic of me) to 5 (Entirely characteristic of me). The measure shows evidence of convergent, criterion, and discriminant validity (Buhr & Dugas, 2002; 2006; Dugas, Gosselin, & Ladouceur, 2001) across various cultures (Norton, 2005). Additionally, the IUS has demonstrated excellent internal consistency ($\alpha = .94$) and good test-retest reliability over five weeks ($r = .78$; Dugas, Freeston, & Ladouceur, 1997). The IUS is presented in Appendix M.

The *Ambiguous/Unambiguous Situations Diary - Extended Version* (AUSD-EX; Koerner & Dugas, 2008) is a measure of individuals' appraisals of positive, negative and ambiguous situations. The AUSD-EX includes 55 vignettes, which are written in the first person. The content of the vignettes relates to 11 domains of worry, including: friendships, romantic relationships, relationships with parents, academic performance, work competence, finances, one's own health, health of loved ones, threat of physical

harm or danger, the future, and self-concept. The worry domains were selected on the basis of previous findings on the qualitative features of non-clinical and clinical worry (Davey et al., 1992; Dugas et al., 1995; Dugas et al., 1998). Five vignettes relate to each domain, with one positive scenario, one negative scenario, and three ambiguous scenarios. Respondents are asked to imagine that each scenario is happening to them (i.e., a diary entry) and to rate the degree to which they feel concerned about it on a Likert scale from 1 (Not at all concerned) to 5 (Extremely concerned). There is some evidence demonstrating that concern over ambiguous scenarios on the AUSD-EX is moderately to highly correlated with greater scores on measures of worry, anxiety, intolerance of uncertainty, and depression, thereby providing support for the scale's convergent validity (Koerner & Dugas, 2008). The AUSD-EX is presented in Appendix N.

The State-Trait Inventory for Cognitive and Somatic Anxiety, Trait Scale (STICSA-T; Ree, MacLeod, French, & Locke, 2000) is a 21-item self-report measure of trait level cognitive and somatic symptoms of anxiety. Responses are rated on a 4-point Likert scale from 1 (Not at all) to 4 (Very much so). The cognitive and somatic scales have been supported by confirmatory factor analyses, and each of these scales has demonstrated high internal consistency ($\alpha = .87$ for both scales; Grös, Antony, Simms, & McCabe, 2007). Furthermore, scores on the STICSA-T scale have been shown to remain stable across situations of low and high stress (Ree, French, MacLeod, & Locke, 2008). Additionally, there is support for the measure's convergent validity (Grös et al., 2007) and construct validity, with scores on the STICSA-T found to yield higher correlations with measures of anxiety than measures of depressive symptoms (Grös et al., 2007; Ree et al., 2008). The STICSA-T is presented in Appendix O.

The *Center for Epidemiological Studies Depression Scale* (CES-D; Radloff, 1977) is a 20-item self-report measure, designed to assess the frequency of common symptoms of depression over the past week. Responses are rated on a Likert scale, ranging from 0 (Rarely or none of the time) to 3 (Most or all of the time). Four of the items are reverse scored, and total scores can range from 0 to 60. The CES-D contains four factors including depressed affect, positive affect, somatic and retarded activity, and interpersonal; thus it assesses various aspects of depression, with a particular focus on the affective components. There is support for the measure's convergent validity based on high correlations with other measures of depression ($r = .87$; Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995). In addition, the CES-D has demonstrated high internal consistency ($\alpha = .86$; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993), as well as moderate sensitivity (63%) and high specificity (94%) in detecting major depressive disorder (Myers & Weissman, 1980). The CES-D is presented in Appendix P.

The *Stimulus Categorization Grid* for Set A and Set B of the WSAP for GAD is a 60-item self-report questionnaire created for this study. The grids were included to validate the WSAP worry domains used. The grid presents stimuli that are identical in content to the 60 pairs of negative/threatening words and ambiguous sentences, shown in the respective WSAP computer task (e.g., "Your shirt has red stains all over it - *Blood*"). Respondents were asked to categorize each sentence-word pair into one of the 10 domains of worry provided and labelled from 1 to 10 (e.g., "3" = physical harm to self). Participants who were randomly assigned to Set A of the WSAP computer task were given Set B of the categorization grid, and vice versa; thus participants were not shown the same set of sentence and word pairs in the categorization grid and the computer task.

Responses were examined to determine whether the WSAP items were reliable in capturing the intended domains of worry.

Results

Data Screening

The data were screened for skewness, kurtosis, univariate outliers, multivariate outliers, unusual patterns in the data, and out-of-range values. The data were normally distributed (all skewness values < 3.0 and kurtosis values < 10.0 ; Kline, 2009).

Additionally, the data were free of multivariate outliers, multicollinearity, and out-of-range scores. The dataset was not modified for the following analyses.

Validity of the WSAP

We examined the validity of the two word-sentence association paradigm computer tasks by examining Pearson correlation coefficients between the WSAP total threat interpretation scores (i.e., the *discriminant scores*), and the AUSD-EX, a measure of interpretation bias. Specifically, WSAP total threat scores were computed for each participant based on the discriminant function linear equation, combining the two subscales (the weighted combination of threat accept and benign reject scores) to maximally distinguish between the groups (Field, 2005).

The results from Set A indicated that the scores on the WSAP total threat bias scale (i.e., the *variate*), derived from the discriminant linear equations, showed a trend towards being positively correlated with scores on the AUSD-EX total scale, $r = .281$, $p = .050$, and was significantly correlated with the AUSD-EX ambiguous subscale, $r = .322$, $p = .024$. Similarly, the results from Set B indicated that the discriminant scores obtained for the WSAP total threat bias variate positively correlated with scores on the

AUSD-EX total scale, $r = .339$, $p = .018$, and scores on the AUSD-EX ambiguous subscale, $r = .315$, $p = .029$. These results suggest that individuals who more frequently endorsed threat interpretations on the WSAP were also more likely to endorse negative interpretations of ambiguous situations on the AUSD-EX.

Additionally, split-half correlation coefficients were examined for each subscale to assess how consistently participants responded to word-sentence pairs on the WSAP. Specifically, responses on the subscales of the two Sets were examined, separately, to explore how consistent individuals were at accepting threat interpretations, and rejecting benign interpretations. Based on results from the Cronbach Alpha reliability index (i.e., the average of all possible split-half reliabilities for each subscale), individuals assigned to Set A responded relatively consistently across all of the threat word trials, $r = .766$, and benign word trials, $r = .813$. Similarly, individuals assigned to Set B responded consistently across threat word trials, $r = .849$, and benign word trials, $r = .790$. These split-half item reliability indices suggest that the participants were consistent in their tendency to reject or accept a relation between a threat or benign word, and the paired ambiguous sentence. Given the heterogeneity of worry content in GAD, the relatively high (but not extremely high) correlations were expected; individuals indicated an overall bias in their interpretations, however, these biases may have been more strongly endorsed for some of the domains of worry compared to others.

Validity of the Grouping Variable

We used the recommended cut-off score of 5.7 out of 13 on the GAD-Q-IV (Newman et al., 2002) to determine group membership in the sample. Using this cut score, 37.1% ($n = 36$) of the total sample were classified as GAD analogues (38.8% of

individuals who completed Set A, 35.4% who completed Set B), and 62.9% ($n = 61$) were classified as not meeting GAD criteria (61.2% from Set A, 64.6% from Set B). We examined the validity of the GAD-Q-IV in the total sample (i.e., across Sets A and B combined) using One-Way Analyses of Variance (ANOVA) to compare the GAD analogue group to the non-GAD group on various related measures.

The results indicated that the GAD analogue group scored higher on the PSWQ ($M = 62.64$, $SD = 9.29$) than did the non-GAD group ($M = 39.56$, $SD = 10.82$), $F(1, 95) = 114.16$, $p < .001$. Additionally, the GAD analogue group scored higher on the IUS full scale ($M = 81.53$, $SD = 19.75$) than the non-GAD group ($M = 52.13$, $SD = 14.64$), $F(1, 95) = 70.09$, $p < .001$; GAD analogues scored higher on the IUS factor 1 subscale ($M = 42.33$, $SD = 11.46$) than did the non-GAD group ($M = 26.00$, $SD = 7.93$), $F(1, 95) = 68.57$, $p < .001$, and the GAD analogue group scored higher on the IUS factor 2 subscale ($M = 39.19$, $SD = 9.80$) than did the non-GAD group ($M = 26.13$, $SD = 8.02$), $F(1, 95) = 50.83$, $p < .001$. The GAD analogue group scored higher on the STICSA-T full scale ($M = 43.85$, $SD = 9.61$) than did the non-GAD group ($M = 30.90$, $SD = 6.24$), $F(1, 95) = 64.81$, $p < .001$; the GAD analogue group scored higher on the STICSA-T cognitive subscale ($M = 24.53$, $SD = 6.17$) than did non-GAD group ($M = 16.33$, $SD = 5.27$), $F(1, 95) = 48.26$, $p < .001$, and the GAD analogue group scored higher on the STICSA-T somatic subscale ($M = 19.32$, $SD = 4.71$) than did the non-GAD group ($M = 14.57$, $SD = 2.95$), $F(1, 95) = 37.41$, $p < .001$. Finally, the GAD analogue group scored higher on the CES-D ($M = 24.22$, $SD = 10.27$) than did the non-GAD group ($M = 9.57$, $SD = 6.09$), $F(1, 95) = 77.97$, $p < .001$. These results suggest that, compared to the non-GAD group, GAD-analogues reported significantly higher scores on measures of constructs that are

theoretically and clinically related to the syndrome of GAD including anxiety, worry, and depressive symptomatology.

See Tables 2a and 2b for the means and standard deviations on self-report questionnaires and WSAP subscales for the GAD analogues group and the non-GAD group, examining the samples assigned to WSAP Set A and Set B, separately.

Table 2a (continued on the next page)

Means and Standard Deviations on Measures Obtained from the GAD Analogue and Non-GAD Group Assigned to Set A of the WSAP

| Variable | Group | |
|------------|-------------------------------|--------------------------|
| | GAD analogue <i>M (SD)</i> | Non-GAD <i>M (SD)</i> |
| PSWQ* | 63.68 (8.19) | 39.73 (10.79) |
| IUS | | |
| Total* | 86.42 (16.13) | 53.30 (14.67) |
| Factor 1* | 44.37 (9.55) | 26.73 (9.03) |
| Factor 2* | 42.05 (8.62) | 26.57 (7.56) |
| AUSD-EX | | |
| Total* | 168.74 (27.07) | 136.97 (26.38) |
| Positive* | 20.95 (7.70) | 15.13 (5.98) |
| Negative | 46.42 (6.86) | 42.53 (6.78) |
| Ambiguous* | 101.37 (18.72) | 79.30 (18.15) |
| STICSA-T | | |
| Total* | 43.68 (10.65) | 32.17 (7.42) |
| Cognitive* | 24.84 (6.43) | 17.27 (6.70) |
| Somatic* | 18.84 (5.07) | 14.90 (2.64) |
| CES-D* | 23.05 (8.10) | 9.67 (5.47) |

Note. N = 49; GAD = Generalized anxiety disorder; PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale; AUSD-EX = Ambiguous/Unambiguous Situations Diary - Extended version; STICSA-T = State-Trait Inventory for Cognitive and Somatic Anxiety - Trait scale; CES-D = Center for Epidemiological Studies - Depression scale.

*Means are statistically different, $p < .05$.

Table 2b (continued on the next page)

Means and Standard Deviations on Measures Obtained from the GAD Analogue and Non-GAD Group Assigned to Set B of the WSAP

| Variable | Group | |
|-----------|-------------------------------|--------------------------|
| | GAD analogue <i>M (SD)</i> | Non-GAD <i>M (SD)</i> |
| PSWQ* | 61.47 (10.51) | 39.39 (11.02) |
| IUS | | |
| Total* | 76.06 (22.38) | 51.00 (14.76) |
| Factor 1* | 40.06 (13.20) | 25.29 (6.78) |
| Factor 2* | 36.00 (10.30) | 25.71 (8.54) |
| AUSD-EX | | |
| Total* | 154.65 (35.08) | 136.55 (23.81) |
| Positive | 21.76 (11.10) | 16.94 (7.17) |
| Negative | 44.00 (7.98) | 40.68 (8.64) |
| Ambiguous | 88.88 (22.38) | 78.94 (15.06) |
| STICSA-T | | |
| Total* | 44.04 (8.61) | 29.68 (4.64) |

| | | |
|------------|---------------|--------------|
| Cognitive* | 24.18 (6.03) | 15.42 (3.22) |
| Somatic* | 19.86 (4.35) | 14.26 (3.22) |
| CES-D* | 25.53 (12.39) | 9.48 (6.74) |

Note. N = 48; GAD = Generalized anxiety disorder; PSWQ = Penn State Worry Questionnaire; IUS = Intolerance of Uncertainty Scale; AUSD-EX = Ambiguous/Unambiguous Situations Diary - Extended version; STICSA-T = State-Trait Inventory for Cognitive and Somatic Anxiety - Trait scale; CES-D = Center for Epidemiological Studies - Depression scale.

*Means are statistically different, $p < .05$.

Hypothesis 1

It was hypothesized that the GAD analogue group would show a greater overall threat interpretation bias as compared to the non-GAD group on the WSAP computer task. The overall threat bias scores were obtained from the discriminant function combining the two WSAP subscale scores (*threat accept* and *benign reject*) to predict GAD status. Thus, to examine differences between the groups on the combination of these subscales, a One-Way Multivariate Analysis of Variance (MANOVA) was conducted. GAD status (i.e., GAD analogue or non-GAD) served as the categorical independent variable, and the threat interpretation bias subscales (i.e., threat accept and benign reject) served as the dependent variables. Given that this is the first study to use the WSAP stimuli for GAD, the hypothesis was examined for Set A and Set B, independently.

Overall Threat Interpretation Bias for Set A

Among individuals randomly assigned to Set A, 38.8% ($n = 19$) were classified as meeting GAD-analogue status and the remainder ($n = 30$) were classified as not meeting GAD analogue status (i.e., non-GAD). Results from the MANOVA indicated that the multivariate main effect for GAD status was not statistically significant in explaining the variance in overall threat interpretation bias scores, Wilks' $\lambda = 0.974$, $F(1, 47) = 0.61$ $p = .547$, $\eta^2 = .0026$. The results indicated that GAD status in Set A explained only 2.6% of the variance in the composite created from the set of two dependent variables.

Overall Threat Interpretation Bias for Set B

Among individuals randomly assigned to Set B, 35.4% ($n = 17$) were classified as GAD-analogue and the remainder ($n = 31$) were classified as individuals in the non-GAD group. Results from the multivariate main effect for GAD status was statistically significant in explaining the variance in overall threat interpretation bias scores, Wilks' $\lambda = 0.787$, $F(1, 46) = 6.1$, $p = .005$, $\eta^2 = 0.213$. The results indicated that GAD status in Set B explained 21.3% of the variance in the composite created by the two WSAP threat interpretation subscale scores.

Hypothesis 2

It was hypothesized that, compared to the non-GAD group, the GAD analogue group would be more likely to both accept threat interpretations and reject benign interpretations of ambiguous sentences on the word-sentence association paradigm computer task. Thus, we followed up the multivariate analyses of variance with a Discriminant Function Analysis (DFA) to examine the relative contribution of each WSAP subscale in predicting group membership, controlling for their intercorrelation. A discriminant function was extracted based on a linear equation of the scores on the

dependent variables to maximally discriminate between the groups (Tabachnick & Fidell, 2007). Each variable's contribution to predicting GAD status was derived from the structure coefficients (correlations between the WSAP subscales and the extracted discriminant function/variante). Significance of the coefficients was decided on the basis of the widely accepted rule for what is considered a meaningful loading on a function (structure coefficients $> .400$; Tabachnick & Fidell, 2007).

Given that this research is the first to use the WSAP stimuli for GAD, we felt it would be beneficial to utilize a DFA for both statistically significant and non-significant multivariate effects, in an effort to better understand how each subscale contributed to the explained variability between the groups. Conducting separate DFAs for Set A and Set B may also provide insight into the differences and/or similarities between the two WSAP Sets. Nonetheless, it is important to note that a non-significant multivariate effect obtained on a MANOVA is not typically followed up with a DFA.

Threat Interpretation Bias for Set A

A DFA was conducted following a non-significant multivariate effect of GAD status to assess how the two variables, the threat accept and benign reject WSAP subscales, differentially contribute to the variate (i.e., the function). Of the small proportion of explained variance between the groups (2.6%) the tendency to accept threat interpretations on the WSAP was considered a meaningful variable in distinguishing between the groups (structure coefficient = $.743$). In contrast, the tendency to reject benign interpretations was not a meaningful variable (structure coefficient = $.046$). The threat accept subscale accounted for a meaningful proportion of the explained variance

between the groups (albeit not statistically significant), whereas the benign reject subscale did not.

Threat Interpretation Bias for Set B

A DFA was conducted following a statistically significant multivariate effect of GAD status to assess the relative contributions of the WSAP subscales in accounting for the variance explained between the groups (21.3%). The threat accept subscale on the WSAP was not considered to be meaningful in predicting group membership (structure coefficient = .220). In contrast, the benign reject subscale was found to be a meaningful variable (structure coefficient = .512), thereby explaining a significant portion of the statistically significant proportion of explained variance between the GAD analogue and the non-GAD group. See Table 3 for the percentage scores on the WSAP scales, for Sets A and B.

Table 3 (continued on the next page)

Score Means and Standard Deviations for the GAD Analogue and Non-GAD Group on WSAP Sets A and B Scales

| Variable | WSAP Set A ($n = 49$) | | WSAP Set B ($n = 48$) | |
|----------------------------|--------------------------|---------------------|--------------------------|---------------------|
| | Group | | Group | |
| | GAD analogue $M (SD)$ | Non-GAD $M (SD)$ | GAD analogue $M (SD)$ | Non-GAD $M (SD)$ |
| WSAP subscale ^a | | | | |
| Threat Accept | 66.67 (19.98) | 61.94 (19.03) | 57.25 (15.2) | 52.96 (19.84) |
| Benign Reject | 19.04 (12.3) | 18.83 (14.17) | 28.73 (15.27) | 21.08 (13.33) |

Note. GAD = Generalized Anxiety Disorder; WSAP = Word-Sentence Association Paradigm.

^aAll values listed are in percentage units, indicating the proportion of threat interpretations that were accepted out of a set of 60 trials and the proportion of benign interpretations that were rejected out of a different set of 60 trials.

Predicting GAD Status Based on Threat Interpretation Bias Subscales

To determine how well the discriminant function (i.e., combining the WSAP subscales) predicted GAD status, we used the Discriminant Function Analysis Classification Summary. The accuracy of these classifications indicated how distinct the groups were at the case level. As previously mentioned, the function served to make the groups as distinct as possible by minimizing the overlap between the distribution of scores, and as a result, allowing for the largest proportion of accurately predicted cases (i.e., as meeting GAD analogue status or non-GAD status). Additionally, the analysis accounted for user-indicated population base rates, which were indicated as equivalent to those of the sample in the current study.

Classification Predictions for Set A

The results in the classification table were based on a 38.8% probability of being in the GAD analogue group and a 61.2% probability of being in the non-GAD group (i.e., Set A sample base rates for GAD status). The classification results suggested, overall, moderate predictive power with 29 of 49 individuals (59.2%) correctly classified based on the linear equation of the discriminant function. Of 19 individuals in the GAD analogue group, 12 (63.2%) were correctly classified and of 30 individuals in the non-GAD group, 17 (56.7%) were correctly classified. The results suggested that the

probability of accurately predicting GAD status based on the discriminant function (of the two subscales) was slightly greater than predictions made on the basis of chance (50%). Furthermore, the function was better at accurately predicting GAD analogue status than non-GAD status (see Table 4a). These results must be interpreted with caution given the non-significant multivariate main effect of GAD status in explaining the WSAP subscale scores in combination.

Table 4a.

Classification Results for Set A (n = 49) with Sample Base Rates for GAD Status

| GAD status | | Predicted group membership | | Total |
|-------------------|--------------|-----------------------------------|---------------------|--------------|
| Original | Count | Non-GAD | GAD analogue | |
| | Non-GAD | 17 | 13 | 30 |
| | GAD analogue | 7 | 12 | 19 |
| | % | | | |
| | Non-GAD | 56.7 | 43.3 | 100.0 |
| | GAD analogue | 36.8 | 63.2 | 100.0 |

Note. GAD = Generalized Anxiety Disorder.

Classification Predictions for Set B

The results in the classification table was based on a 35.4% probability of being in the GAD analogue group and a 64.6% probability of being in the non-GAD group (i.e., Set B samples base rates for GAD status). The classification results suggested moderate to good predictive power with 33 of 48 individuals (68.8%) correctly classified. Of 17 individuals in the GAD analogue group, 11 (64.7%) were correctly classified and of 31 individuals in the non-GAD group, 22 (71%) were correctly classified. The findings

suggested that the probability of accurately predicting group membership based on the discriminant function, which combines the dependent variables, was considerably greater than predictions made on the basis of chance (50%). In addition, the function was better at accurately predicting non-GAD status than GAD analogue status (see Table 4b).

Table 4b.

Classification Results for Set B (n = 48) with Sample Base Rates for GAD Status

| GAD status | | Predicted group membership | | Total |
|-------------------|--------------|-----------------------------------|--------------|--------------|
| Original | Count | Non-GAD | GAD analogue | |
| | Non-GAD | 22 | 9 | 31 |
| | GAD analogue | 6 | 11 | 17 |
| | % | | | |
| | Non-GAD | 71.0 | 29.0 | 100.0 |
| | GAD analogue | 35.3 | 64.7 | 100.0 |

Note. GAD = Generalized Anxiety Disorder.

Discussion

The main objective of the current study was to assess the reliability of two newly developed word-sentence association paradigm (WSAP) computer tasks in measuring interpretation bias. As compared to the non-GAD group, individuals in the GAD analogue group were expected to perceive an association between negative words and related ambiguous sentences more frequently, and perceive an association between neutral/positive words and related ambiguous sentences less frequently. In this way, our measures were designed to assess a bias toward more threat interpretations and fewer

benign interpretations among individuals meeting criteria for generalized anxiety disorder.

Overall, our findings suggest that WSAP Set B is a reliable measure of interpretation bias, which is consistent with our hypotheses. When utilizing WSAP Set B, the GAD analogue group endorsed a significantly greater overall threat interpretation bias relative to the non-GAD group. These results support the hypothesis that individuals in the GAD analogue group would endorse threat interpretations more frequently than individuals in the non-GAD group (*Hypothesis 1*). Contrary to our hypotheses, the results did not support the reliability of WSAP Set A as a measure of interpretation bias.

Rejection of Benign Disambiguations

Specifically, when using Set B, the GAD analogue group was reliably distinguished from the non-GAD group by the tendency to reject benign interpretations. In other words, individuals with greater anxiety demonstrated a greater tendency to reject a relation between positive or neutral words and ambiguous sentences compared to less anxious individuals. This provides partial support for the first part of *Hypothesis 2*, as individuals in the GAD analogue group perceived an association between neutral/positive words and related ambiguous sentences less frequently than individuals in the non-GAD group. Contrary to our hypothesis, no between-group differences were found in the tendency to reject benign interpretations when using WSAP Set A.

A lack of measurement sensitivity may help to explain the WSAP Set A's inability to reliably distinguish between the two groups in the frequency of rejected benign interpretations. The proportions of benign rejections made across the four groups provide support for the differential sensitivity between the two sets. Compared to the

higher rates of rejected benign disambiguations in the GAD analogue group from Set B (28.7%), lower rates were found in the non-GAD group from Set B (21.1%), and in the non-GAD and GAD analogue groups from Set A (18.8% and 19.0%, respectively). Thus, the GAD analogue group assigned to Set B is distinguished from the three other groups in the study on the basis of fewer benign interpretations endorsed (i.e., more benign rejections). Given these findings, it is possible that the pairs of words and sentences in Set A are more obviously related to one another than in Set B; as a result, participants were more likely to perceive and therefore accept an association between Set A's word-sentence pairs than not, irrespective of their GAD status.

Acceptance of Threat Disambiguations

Contrary to what was hypothesized (the second part of *Hypothesis 2*), the two groups did not differ in their tendency to accept threatening disambiguations for word-sentence pairs in both Set A and Set B. In other words, GAD analogues accepted a relation between negative words and ambiguous sentences at a rate similar to those in the non-GAD group in both WSAP stimulus Sets. Again, a possible explanation for this finding is a lack of measurement sensitivity. The threatening words and ambiguous sentences may have been perceived as related to a similar degree across the groups, thereby restricting the sensitivity of this subscale in detecting a greater association between threat words and ambiguous sentences (i.e., acceptance of threat interpretations) in the GAD analogue group relative to the non-GAD group. Alternatively, a lack of measurement specificity cannot be ruled out in explaining these results, given that there were no significant differences across the four groups in their rates of accepting threatening interpretations. Specifically, the results indicate relatively high proportions of

accepted threat disambiguations in both the GAD analogue group and the non-GAD group in Set A (66.7% and 61.9%, respectively) and Set B (57.3% and 53.0%, respectively). In general, it appears that individuals demonstrate a propensity towards accepting a relation between paired words and sentences across the WSAP trials. As such, the WSAP threat accept subscale may overestimate the tendency to which individuals in the non-GAD group accept threat interpretations, relative to the GAD analogue group.

Assessment of GAD Worry Themes

The WSAP's ability to only partially distinguish individuals in the GAD analogue group from those in the non-GAD group may be explained by the nature, rather than content of their worries. GAD is characterized by uncontrollable and excessive worry about various domains of life (e.g., social relationships, health, and finances), which are comparable to the worry domains reported by individuals in the general population. As such, it has been shown that individuals with GAD differ from non-anxious controls in that their worries are more intense and frequent (e.g., Brown, O'Leary, & Barlow, 1993; Wells, 1994), which the WSAP does not measure directly. In other words, heightened intensity and frequency of worries about a particular domain of life may not necessarily be detected by a measure that assesses the presence or absence of bias at a single point in time. The WSAP as an assessment tool may be better at detecting particular worry domains about which threat and benign interpretation biases are made (e.g., "I worry about disappointing my boss") rather than detecting the frequency and intensity of the individuals' worries (e.g., "Ten times a day I worry about disappointing my boss and losing my job"). Notwithstanding its possible shortcomings, the WSAP stimuli may be

useful in a bias modification program. With the inclusion of systematic feedback to responses made on the WSAP, the task has the potential to successfully decrease the frequency and intensity of threat endorsements (and increase the frequency and intensity of benign endorsements) related to the domains of worry.

Moreover, the WSAP may reliably detect interpretation biases in GAD; however, due to the large number of possible worry themes in GAD it is possible that these worry-related biases are difficult to uncover. Distinguishing individuals with GAD from those without GAD on the WSAP may be particularly difficult with individuals who experience worry about only a few of the 10 worry domains; the percentage of endorsed threat interpretations related to these domains may be too low to distinguish individuals with GAD from those without GAD. The challenges in assessing biases in GAD may not be present to the same degree when assessing biases in other anxiety disorders, such as, social anxiety and panic disorder, which are characterized by fewer and more specific domains of concern. The more “focused” concerns in these other anxiety disorders are expected to be sensitive and relatively specific markers of the disorder, thereby lending themselves to more reliable assessment than those for GAD. For example, individuals with social anxiety are mainly concerned about social situations and are, therefore, expected to engage in more threatening disambiguations of socially-relevant ambiguous sentences. As such, relative to GAD, the WSAP may be more reliable in assessing and distinguishing individuals with social anxiety and panic disorder from their non-anxious counterparts.

Final Considerations

Our findings suggest that individuals in the GAD analogue group are more likely to reject benign interpretations than individuals in the non-GAD group. This is consistent with cognitive theory positing a relationship between anxiety and the tendency to perceive threat in ambiguity (Clark & Beck, 2010). Specifically, our results align with the extant literature demonstrating that individuals with greater trait anxiety are less likely to interpret ambiguous situations in a positive or benign manner as compared to individuals with lower trait anxiety (Eysenck et al., 1987; Eysenck, Mogg, May, Richards, & Mathews, 1991; Mathews et al., 1989).

Moreover, previous studies investigating the influence of word primes on ambiguous information (e.g., homophones and homographs) have demonstrated that, relative to non-anxious individuals, those with GAD rely on threat-related primes, but not neutral primes, to interpret ambiguous stimuli (e.g., Hazlett-Stevens & Borkovec, 2004; Mogg et al., 1994). Our findings are also consistent with research utilizing a similar WSAP to assess biased interpretations in social anxiety. These studies have shown that, in contrast to individuals without social anxiety who demonstrate a greater tendency to accept benign disambiguations and reject threatening disambiguations, individuals with heightened social anxiety symptoms accept benign and threatening disambiguations at an equal rate. In other words, non-anxious controls are more likely to perceive ambiguous social situations as being benign than threatening, whereas socially anxious individuals are as likely to perceive ambiguous social situations as being benign, as they are to perceive them as being threatening (Beard & Amir, 2009). In accordance with past research, the results from the present study provide evidence of negative appraisal biases in anxiety.

Limitations and Future Directions

Despite some encouraging findings, the current study had several limitations. The study used a non-clinical sample, which decreases its generalizability to clinical samples. Although analogue samples have been shown to be similar to clinically diagnosed samples with GAD on various measures of worry and anxiety (Roemer, Borkovec, Posa, & Borkovec, 1995), it is unclear if analogue and clinical samples are sufficiently similar on measures of interpretation bias. Further research is necessary to elucidate the comparability of these groups in their endorsement of interpretation biases.

An additional limitation of the current study was the absence of a post-WSAP comprehension test to assess reading comprehension of, and memory for, the words presented prior to the ambiguous sentences. Given that the words were briefly presented on the computer screen, it is possible that participants were not able to accurately attend to or recall the words on some of the trials. As a result, participants may have responded without knowledge or memory of which words were shown thereby providing responses that were not accurate representations of their true interpretation biases.

A final limitation is the lack of practice trials and control trials in the WSAP computer task. It is possible that practice trials presented at the beginning of the WSAP program would have prepared participants for the experimental trials, such as what area of the computer screen to attend to and the speed with which the stimuli appear. The opportunity for practice may have decreased the likelihood of difficulties with reading comprehension or memory for words, by providing participants with knowledge of what to expect on the experimental trials. Additionally, control trials (i.e., benign or threat words paired with unrelated rather than related ambiguous sentences) randomly presented

throughout the WSAP task may have been useful in detecting reading comprehension difficulties and arbitrary response styles.

Future investigations should focus on differences between WSAP Sets A and B, as a better understanding of the Sets may contribute to theory and research development on interpretative biases in GAD. Additional research is also needed to clarify whether, relative to non-anxious controls, individuals with GAD are more likely to (1) accept threat interpretations, (2) reject benign interpretations, or (3) demonstrate both of these biases when faced with ambiguity. Another avenue for future exploration involves the use of the word-sentence association paradigm to decrease threat interpretations, increase benign interpretations and reduce symptom severity in individuals with GAD, as was done with a WSAP for social phobia (e.g., Beard & Amir, 2008). Finally, studies should investigate whether a selection of specific WSAP items, reflecting particular themes of worry that are personally-relevant to an individual (rather than all 10 themes), would be more useful in reliably detecting and subsequently modifying interpretation biases in GAD.

Conclusions

The results from the current study provide partial support for the use of a word-sentence association paradigm in detecting threat interpretation biases in GAD.

Specifically, Set B reliably distinguished between individuals meeting and not meeting GAD diagnostic criteria with respect to their tendency to reject benign interpretations.

The results from the current study, coupled with existing research and cognitive theory on the role of bias in anxiety, provide support for the utility of the GAD WSAP in assessing threat and benign interpretation biases. Furthermore, these results have important

implications for the use of the WSAP in an interpretation-modification training program, to augment current cognitive-behavioural treatment protocols.

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Appendix A
SOCIODEMOGRAPHICS FORM

ID# _____

General Information

Age: _____**Sex:** Male _____ Female _____**Education:***Current University Year:*

1 _____ 2 _____ 3 _____ 4 _____ Other _____

Field of study: Psychology _____ Other (Please specify) _____*Status:* full-time _____ part-time _____**First Language:**

English _____ French _____ Other (please specify) _____

If English is not your first language, do you consider yourself fluent in English?

Yes _____

No _____

Race / Ethnicity: (check one)

African-American / Black / Caribbean Origin _____

Asian-American / Asian Origin / Pacific Islander _____

Latino-a / Hispanic _____

American Indian / Alaska Native / Aboriginal Canadian _____

European Origin / White _____

Bi-racial / Multi-racial _____

Middle Eastern _____

Other (Please Specify) _____

Appendix B

POSTER ADVERTISEMENT FOR PARTICIPANT RECRUITMENT

Appendix C

ONLINE ADVERTISEMENT FOR PARTICIPANT RECRUITMENT

Title: Psychology Study, 45 minutes and earn \$10!!!!

We are currently looking for individuals aged 18 to 65 who are fluent in English. If you are interested and would like to participate in this research study being conducted at Concordia University, please email: aogniewicz@gmail.com Participation includes a 45 minute session with a computer task and questionnaires (compensation of \$10).

This study is funded by the Social Sciences and Humanities Council of Canada (SSHRC ref.: 766-2010-0797).

7141 Sherbrooke Street West
Montreal, Quebec
H4B 1R6
Avital Ogniewicz
514-848-2424 Ext 2229

Appendix D

CONSENT FORM FOR UNIVERSITY STUDENT PARTICIPANTS

CONSENT TO PARTICIPATE IN: REACTIONS TO SITUATIONS STUDY

This is to state that I agree to participate in a program of research being conducted by Avital Ogniewicz, under the supervision of Dr. Michel Dugas, of the Department of Psychology at Concordia University.

Avital Ogniewicz (MA candidate)
 Tel: 514-848-2424, ext 2229
 Email: aogniewicz@yahoo.ca

Co-Investigators:

Naomi Koerner, PhD, Assistant Professor, Dept of Psychology, Ryerson University
 Patrick Gosselin, PhD, Associate Professor, Dept of Psychology, Université de Sherbrooke
 Frédéric Langlois, PhD, Assistant Professor, Dept of Psychology, Université du Québec à Trois-Rivières

A. PURPOSE

The purpose of the research is to examine psychological factors involved in how people make sense of everyday situations.

B. PROCEDURES

The study will involve one visit to the Anxiety Disorders Laboratory at Concordia University, located at 7141 Sherbrooke Street West, SP building, 319.05 (3rd floor). You are asked to arrange to transport yourself to the Anxiety Disorders Lab. The total time commitment will be approximately 1 hour. You will be asked to complete a package of questionnaires about your thoughts, emotions, and behaviour. You will then be asked to complete a computer task in which you will make judgments about whether words and sentences are related or unrelated and a task in which you will indicate your reactions to brief descriptions of scenarios. Finally, you will be asked to complete a brief paper-and-pencil categorization task. Please note that almost all questionnaires and tasks that you will be completing in this study have been used in past research.

This informed consent agreement and all data that identifies you will be stored in a locked storage space in the Anxiety Disorders Lab. An ID number as opposed to your name will be used on all questionnaires you complete and in all computer files that contain the data that you generate during the study. The questionnaires that you complete will be kept in a locked file cabinet, separate from this consent agreement and any identifying information. This consent agreement and the questionnaires that you will be completing will be kept for 7 years after the publication of this research, after which they will be shredded. Your confidentiality will be protected to the full extent allowed by law. Only group findings will be reported in publications and presentations arising from this research.

C. RISKS AND BENEFITS

There is minimal risk involved if you agree to take part in this study. You understand that you may experience some transient negative emotions when completing the questionnaires. You have the right to refuse or discontinue participation at any time. If you decided to stop participating, you will still be entitled to compensation for any tasks that you have initiated.

It is possible that you will not receive any benefits from participating in this study, other than the compensation mentioned below. However, you may derive benefit from the self-assessment as it may increase your awareness of your thoughts, emotions and behaviours. You may also develop a better understanding of research methodology, and your participation will provide researchers with valuable insight.

As compensation for participating in this study, you will receive one participation credit for completing the questionnaire package and tasks. You may also obtain one credit by choosing to participate in a 'walk-through' without providing any data. This decision will not affect your relationship with Concordia University and will not affect your academic standing in any way.

D. CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
- I understand that my participation in this study is confidential (i.e., the researcher will know, but will not disclose my identity)
- I understand that the data from this study may be published.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

DATE _____

If at any time you have questions about the proposed research, please contact the study's Principal Investigator:

Dr. Michel J. Dugas (Professor)
 Department of Psychology, Concordia University
 Phone: 514-848-2424, ext 2215
 Email: Michel.Dugas@concordia.ca

If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, Adela Reid, at (514) 848-2424 x7481 or by email at Adela.Reid@Concordia.ca.

Appendix E

CONSENT FORM FOR COMMUNITY VOLUNTEER PARTICIPANTS

CONSENT TO PARTICIPATE IN: REACTIONS TO SITUATIONS STUDY

This is to state that I agree to participate in a program of research being conducted by Avital Ogniewicz, under the supervision of Dr. Michel Dugas, of the Department of Psychology at Concordia University.

Avital Ogniewicz (MA candidate)
 Tel: 514-848-2424, ext 2229
 Email: aogniewicz@yahoo.ca

Co-Investigators:

Naomi Koerner, PhD, Assistant Professor, Dept of Psychology, Ryerson University
 Patrick Gosselin, PhD, Associate Professor, Dept of Psychology, Université de Sherbrooke
 Frédéric Langlois, PhD, Assistant Professor, Dept of Psychology, Université du Québec à Trois-Rivières

A. PURPOSE

The purpose of the research is to examine psychological factors involved in how people make sense of everyday situations.

B. PROCEDURES

The study will involve one visit to the Anxiety Disorders Laboratory at Concordia University, located at 7141 Sherbrooke Street West, SP building, 319.05 (3rd floor). You are asked to arrange to transport yourself to the Anxiety Disorders Lab. The total time commitment will be approximately 1 hour. You will be asked to complete a package of questionnaires about your thoughts, emotions, and behaviour. You will then be asked to complete a computer task in which you will make judgments about whether words and sentences are related or unrelated and a task in which you will indicate your reactions to brief descriptions of scenarios. Finally, you will be asked to complete a brief paper-and-pencil categorization task. Please note that almost all questionnaires and tasks that you will be completing in this study have been used in past research.

This informed consent agreement and all data that identifies you will be stored in a locked storage space in the Anxiety Disorders Lab. An ID number as opposed to your name will be used on all questionnaires you complete and in all computer files that contain the data that you generate during the study. The questionnaires that you complete will be kept in a locked file cabinet, separate from this consent agreement and any identifying information. This consent agreement and the questionnaires that you will be completing will be kept for 7 years after the publication of this research, after which they will be shredded. Your confidentiality will be protected to the full extent allowed by law. Only group findings will be reported in publications and presentations arising from this research.

C. RISKS AND BENEFITS

There is minimal risk involved if you agree to take part in this study. You understand that you may experience some transient negative emotions when completing the questionnaires. You have the right to refuse or discontinue participation at any time. If you decided to stop participating, you will still be entitled to compensation for any tasks that you have initiated.

It is possible that you will not receive any benefits from participating in this study, other than the compensation mentioned below. However, you may derive benefit from the self-assessment as it may increase your awareness of your thoughts, emotions and behaviours. You may also develop a better understanding of research methodology, and your participation will provide researchers with valuable insight.

As compensation for participating in this study, you will \$10 for completing the questionnaire package and tasks. You may also obtain compensation by choosing to participate in a 'walk-through' without providing any data. This decision will not affect your relationship with Concordia University and will not affect your academic standing in any way.

D. CONDITIONS OF PARTICIPATION

- I understand that I am free to withdraw my consent and discontinue my participation at anytime without negative consequences.
- I understand that my participation in this study is confidential (i.e., the researcher will know, but will not disclose my identity)
- I understand that the data from this study may be published.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO PARTICIPATE IN THIS STUDY.

NAME (please print) _____

SIGNATURE _____

DATE _____

If at any time you have questions about the proposed research, please contact the study's Principal Investigator:

Dr. Michel J. Dugas (Professor)
 Department of Psychology, Concordia University
 Phone: 514-848-2424, ext 2215
 Email: Michel.Dugas@concordia.ca

If at any time you have questions about your rights as a research participant, please contact the Research Ethics and Compliance Advisor, Concordia University, Adela Reid, at (514) 848-2424 x7481 or by email at Adela.Reid@Concordia.ca.

Appendix F**WORD-SENTENCE ASSOCIATION PARADIGM SET A STIMULI**

| Word | Sentence | Worry Domain |
|-------------|---|-----------------------|
| Dog | You hear a noise in the night | Physical Harm / Self |
| Robber | You hear a noise in the night | Physical Harm / Self |
| Fog | The air is not clear and it is hard to see | Physical Harm / Self |
| Pollution | The air is not clear and it is hard to see | Physical Harm / Self |
| Neighbour | Someone knocks at your front door | Physical Harm / Self |
| Police | Someone knocks at your front door | Physical Harm / Self |
| Clock | The alarm goes off | Physical Harm / Self |
| Warning | The alarm goes off | Physical Harm / Self |
| Welcome | The captain of your plane addresses the passengers | Physical Harm / Self |
| Warning | The captain of your plane addresses the passengers | Physical Harm / Self |
| Directions | A person approaches you on the street | Physical Harm / Self |
| Mugger | A person approaches you on the street | Physical Harm / Self |
| Playing | Your child is splashing in the water | Physical Harm / Other |
| Drowning | Your child is splashing in the water | Physical Harm / Other |
| Late | Your partner is not home from work yet | Physical Harm / Other |
| Accident | Your partner is not home from work yet | Physical Harm / Other |
| Zoo | The bear approaches your child | Physical Harm / Other |
| Attack | The bear approaches your child | Physical Harm / Other |
| Holiday | Your child is not at school | Physical Harm / Other |
| Missing | Your child is not at school | Physical Harm / Other |
| Busy | You call your mother but she can't get to the phone | Physical Harm / Other |
| Hurt | You call your mother but she can't get to the phone | Physical Harm / Other |
| Walking | Your child steps out into the street | Physical Harm / Other |
| Collision | Your child steps out into the street | Physical Harm / Other |
| Height | The doctor examines your growth | Health / Self |
| Tumor | The doctor examines your growth | Health / Self |
| Better | Your health has changed | Health / Self |
| Worse | Your health has changed | Health / Self |
| Exercise | Your face is sweaty | Health / Self |
| Fever | Your face is sweaty | Health / Self |
| Excited | Your heart is beating very quickly | Health / Self |
| Panicked | Your heart is beating very quickly | Health / Self |
| Exercise | You have trouble catching your breath | Health / Self |
| Asthma | You have trouble catching your breath | Health / Self |

| | | |
|--------------|--|--------------------------|
| Healthy | You are surprised to hear the results of your check-up | Health / Self |
| Ill | You are surprised to hear the results of your check-up | Health / Self |
| Birth | You visit your friend in the hospital | Health / Other |
| Sick | You visit your friend in the hospital | Health / Other |
| Fit | Your father's condition is surprising given his age | Health / Other |
| Unwell | Your father's condition is surprising given his age | Health / Other |
| Bald | Your father is losing his hair | Health / Other |
| Chemotherapy | Your father is losing his hair | Health / Other |
| Diet | Your mother has lost a lot of weight | Health / Other |
| Sick | Your mother has lost a lot of weight | Health / Other |
| Wedding | You help your sister tie her gown | Health / Other |
| Hospital | You help your sister tie her gown | Health / Other |
| Nervous | Your mother's hands are shaking | Health / Other |
| Parkinson's | Your mother's hands are shaking | Health / Other |
| Attractive | You are surprised when you see your blind date | Relationships / Romantic |
| Unattractive | You are surprised when you see your blind date | Relationships / Romantic |
| Traffic | Your date is not here yet | Relationships / Romantic |
| No-show | Your date is not here yet | Relationships / Romantic |
| Chat | Your partner wants to talk | Relationships / Romantic |
| Breakup | Your partner wants to talk | Relationships / Romantic |
| Thoughtful | Your partner's behaviour has changed | Relationships / Romantic |
| Uncaring | Your partner's behaviour has changed | Relationships / Romantic |
| Attractive | Your ex-partner comments on how you look different now | Relationships / Romantic |
| Ugly | Your ex-partner comments on how you look different now | Relationships / Romantic |
| Nightclub | You and your partner are speaking loudly | Relationships / Romantic |
| Fight | You and your partner are speaking loudly | Relationships / |

| | | |
|--------------|---|------------------------|
| | | Romantic |
| Happy | Your friend reacts to your gift | Relationships / Social |
| Disappointed | Your friend reacts to your gift | Relationships / Social |
| Distracted | A friend does not respond when you wave hello | Relationships / Social |
| Angry | A friend does not respond when you wave hello | Relationships / Social |
| Busy | Your friend does not return your call promptly | Relationships / Social |
| Rejecting | Your friend does not return your call promptly | Relationships / Social |
| Funny | People laugh after something you said | Relationships / Social |
| Embarrassing | People laugh after something you said | Relationships / Social |
| Approve | Your friend comments on your behaviour | Relationships / Social |
| Disapprove | Your friend comments on your behaviour | Relationships / Social |
| Applauded | Your performance in the play was commented on by your friends | Relationships / Social |
| Criticized | Your performance in the play was commented on by your friends | Relationships / Social |
| Birthday | Your father calls | Relationships / Family |
| Criticize | Your father calls | Relationships / Family |
| Traveling | You have not seen your family in awhile | Relationships / Family |
| Conflict | You have not seen your family in awhile | Relationships / Family |
| Busy | Your sibling spends less time with you than before | Relationships / Family |
| Disinterest | Your sibling spends less time with you than before | Relationships / Family |
| Away | Your mother is distant | Relationships / Family |
| Cold | Your mother is distant | Relationships / Family |
| Better | Your relationship with your parents has changed | Relationships / Family |
| Worse | Your relationship with your parents has changed | Relationships / Family |
| Improved | Your child is acting differently toward you | Relationships / Family |
| Worsened | Your child is acting differently toward you | Relationships / Family |
| Wealthy | Your bank statement is surprising | Finances |
| Broke | Your bank statement is surprising | Finances |
| Better | Your financial situation has changed | Finances |
| Worse | Your financial situation has changed | Finances |
| Small | You are surprised when you check your credit card balance | Finances |

| | | |
|--------------|---|----------------------|
| Large | You are surprised when you check your credit card balance | Finances |
| Refund | You receive a letter about your income taxes | Finances |
| Owe | You receive a letter about your income taxes | Finances |
| Raise | There is a change in your salary | Finances |
| Payout | There is a change in your salary | Finances |
| Approved | You receive a call from a loan officer | Finances |
| Declined | You receive a call from a loan officer | Finances |
| Hire | There will be major changes at your company over the next 3 years | Work Competence |
| Fire | There will be major changes at your company over the next 3 years | Work Competence |
| Creative | Colleagues find your views unique | Work Competence |
| Weird | Colleagues find your views unique | Work Competence |
| Praise | Your boss wants to meet with you | Work Competence |
| Criticize | Your boss wants to meet with you | Work Competence |
| Hard-working | Your boss comments on your work ethic | Work Competence |
| Lazy | Your boss comments on your work ethic | Work Competence |
| Better | Your manager says the quality of your work has changed | Work Competence |
| Worse | Your manager says the quality of your work has changed | Work Competence |
| Praise | Your supervisor thinks you are responsible | Work Competence |
| Blame | Your supervisor thinks you are responsible | Work Competence |
| Impressed | Your teacher writes many comments on your essay | Academic Performance |
| Disappointed | Your teacher writes many comments on your essay | Academic Performance |
| Cautious | You finish last of everyone on a test | Academic Performance |
| Stupid | You finish last of everyone on a test | Academic Performance |
| Curious | You ask your teacher a question | Academic Performance |
| Confused | You ask your teacher a question | Academic Performance |
| Excellent | You receive an unexpected grade on your test | Academic Performance |
| Fail | You receive an unexpected grade on your test | Academic Performance |
| Accepted | You receive a letter from the school you | Academic |

| | | |
|-------------|---|----------------------|
| | applied to | Performance |
| Rejected | You receive a letter from the school you applied to | Academic Performance |
| Interesting | You overhear students commenting on your class presentation | Academic Performance |
| Boring | You overhear students commenting on your class presentation | Academic Performance |

Appendix G

WORD-SENTENCE ASSOCIATION PARADIGM SET B STIMULI

| Word | Sentence | Worry Domain |
|-------------|--|-----------------------|
| Television | You hear a loud noise downstairs | Physical Harm / Self |
| Gun | You hear a loud noise downstairs | Physical Harm / Self |
| Ketchup | Your shirt has red stains all over it | Physical Harm / Self |
| Blood | Your shirt has red stains all over it | Physical Harm / Self |
| Christmas | Red and blue lights flicker outside your house | Physical Harm / Self |
| Police | Red and blue lights flicker outside your house | Physical Harm / Self |
| Clock | You wake up to the alarm going off | Physical Harm / Self |
| Robber | You wake up to the alarm going off | Physical Harm / Self |
| Weather | Your flight is suddenly cancelled | Physical Harm / Self |
| Terrorist | Your flight is suddenly cancelled | Physical Harm / Self |
| Children | They are chasing you | Physical Harm / Self |
| Thieves | They are chasing you | Physical Harm / Self |
| Confused | Your nephew seems to be lost | Physical Harm / Other |
| Missing | Your nephew seems to be lost | Physical Harm / Other |
| Oil-change | Your mother's car needs to be serviced | Physical Harm / Other |
| Accident | Your mother's car needs to be serviced | Physical Harm / Other |
| Aquarium | You see the shark approach your brother | Physical Harm / Other |
| Attack | You see the shark approach your brother | Physical Harm / Other |
| Vacation | Your friend cannot be reached | Physical Harm / |

| | | |
|-----------------|--|--------------------------|
| | | Other |
| Hurt | Your friend cannot be reached | Physical Harm / Other |
| Lazy | Your father takes the elevator | Physical Harm / Other |
| Injured | Your father takes the elevator | Physical Harm / Other |
| Calm | Your child is still | Physical Harm / Other |
| Frightened | Your child is still | Physical Harm / Other |
| Exercise | Your heart rate increases | Health / Self |
| Panic | Your heart rate increases | Health / Self |
| Meditation | Your breathing changes | Health / Self |
| Asthma | Your breathing changes | Health / Self |
| Diet | You decrease your sugar intake | Health / Self |
| Diabetes | You decrease your sugar intake | Health / Self |
| Night | You cannot see the view anymore | Health / Self |
| Blindness | You cannot see the view anymore | Health / Self |
| Reminder | Your doctor's office calls | Health / Self |
| Urgent | Your doctor's office calls | Health / Self |
| Roller-coaster | You feel dizzy and nauseous | Health / Self |
| Flu | You feel dizzy and nauseous | Health / Self |
| Diet | Your aunt looks thinner | Health / Other |
| Sick | Your aunt looks thinner | Health / Other |
| Forgetful | Your father doesn't recall the event | Health / Other |
| Dementia | Your father doesn't recall the event | Health / Other |
| Babysit | You are taking care of the child | Health / Other |
| Unhealthy | You are taking care of the child | Health / Other |
| Halloween | Your friend's face is covered with a mask | Health / Other |
| Virus | Your friend's face is covered with a mask | Health / Other |
| Congratulations | You send flowers to your friend | Health / Other |
| Ill | You send flowers to your friend | Health / Other |
| Winter | Your sister is beginning to look more pale | Health / Other |
| Disease | Your sister is beginning to look more pale | Health / Other |

| | | |
|--------------|--|--------------------------|
| Marriage | You and your partner have an important discussion | Relationships / Romantic |
| Break-up | You and your partner have an important discussion | Relationships / Romantic |
| Gift | You did not expect that from your partner | Relationships / Romantic |
| Adultery | You did not expect that from your partner | Relationships / Romantic |
| Compliment | Your partner comments on your outfit | Relationships / Romantic |
| Insult | Your partner comments on your outfit | Relationships / Romantic |
| Tired | You and your partner leave the party early | Relationships / Romantic |
| Arguing | You and your partner leave the party early | Relationships / Romantic |
| Traffic | Your date has not arrived | Relationships / Romantic |
| Uninterested | Your date has not arrived | Relationships / Romantic |
| Thrilled | Your blind date looks surprised when he sees you | Relationships / Romantic |
| Disappointed | Your blind date looks surprised when he sees you | Relationships / Romantic |
| Occupied | Your friend hasn't called you back | Relationships / Social |
| Upset | Your friend hasn't called you back | Relationships / Social |
| Vacation | Your co-worker tells you to go away | Relationships / Social |
| Argument | Your co-worker tells you to go away | Relationships / Social |
| Away | Your friend is not attending your birthday celebration | Relationships / Social |
| Rejection | Your friend is not attending your birthday celebration | Relationships / Social |
| Presentation | Your peers are watching you | Relationships / Social |
| Judging | Your peers are watching you | Relationships / |

| | | |
|---------------|--|------------------------|
| | | Social |
| Approval | A friend gives you feedback about your decision | Relationships / Social |
| Criticism | A friend gives you feedback about your decision | Relationships / Social |
| Flattering | Your friends are discussing your outfit | Relationships / Social |
| Dislike | Your friends are discussing your outfit | Relationships / Social |
| Photo | Your brother isn't in the picture | Relationships / Family |
| Conflict | Your brother isn't in the picture | Relationships / Family |
| Vacation | You haven't seen your mother in weeks | Relationships / Family |
| Argument | You haven't seen your mother in weeks | Relationships / Family |
| Busy | Your father doesn't answer your call | Relationships / Family |
| Angry | Your father doesn't answer your call | Relationships / Family |
| University | You move out of your parents' house | Relationships / Family |
| Unhappy | You move out of your parents' house | Relationships / Family |
| Enjoyable | Family dinners are interesting | Relationships / Family |
| Uncomfortable | Family dinners are interesting | Relationships / Family |
| Postpone | Your cousin cancels lunch plans for tomorrow | Relationships / Family |
| Avoid | Your cousin cancels lunch plans for tomorrow | Relationships / Family |
| Less | Your credit card balance is substantially different this month | Finances |
| More | Your credit card balance is substantially different this month | Finances |
| Plenty | You are startled by the amount of money in your bank account | Finances |

| | | |
|--------------|---|----------------------|
| Little | You are startled by the amount of money in your bank account | Finances |
| Pay-method | You are not sure how you will pay for your meal | Finances |
| Broke | You are not sure how you will pay for your meal | Finances |
| Survey | You receive a call from your bank | Finances |
| Fraud | You receive a call from your bank | Finances |
| Investments | You meet with your accountant to discuss your financial situation | Finances |
| Debts | You meet with your accountant to discuss your financial situation | Finances |
| Forgotten | You haven't paid this month's bills | Finances |
| Unable | You haven't paid this month's bills | Finances |
| Reward | You hear your supervisor is looking for you | Work Competence |
| Criticize | You hear your supervisor is looking for you | Work Competence |
| Promoted | Your position in the company has changed | Work Competence |
| Demoted | Your position in the company has changed | Work Competence |
| Improved | You have adapted to the new work environment | Work Competence |
| Worsened | You have adapted to the new work environment | Work Competence |
| Admire | Your co-worker often asks you questions about your work | Work Competence |
| Patronize | Your co-worker often asks you questions about your work | Work Competence |
| Impressed | Your boss wants to discuss your work productivity | Work Competence |
| Disappointed | Your boss wants to discuss your work productivity | Work Competence |
| Better | Your new job has changed your life | Work Competence |
| Worse | Your new job has changed your life | Work Competence |
| Excited | You wait for your mark in anticipation | Academic Performance |
| Afraid | You wait for your mark in anticipation | Academic Performance |
| Praise | Your teacher provides you with a lot of feedback | Academic Performance |
| Criticism | Your teacher provides you with a lot of feedback | Academic Performance |
| Attentive | The class is silent throughout your presentation | Academic Performance |

| | | |
|--------------|--|----------------------|
| Bored | The class is silent throughout your presentation | Academic Performance |
| Uninterested | You decide to drop the class after a month | Academic Performance |
| Failing | You decide to drop the class after a month | Academic Performance |
| Challenge | The course is difficult | Academic Performance |
| Failure | The course is difficult | Academic Performance |
| Easy | You hand in your exam an hour early | Academic Performance |
| Give-up | You hand in your exam an hour early | Academic Performance |

Appendix H

SET A STIMULUS CATEGORIZATION GRID

Statement Categorization Grid (A)

Below are a series of 60 short statements, paired with a related word in italics. Please read each statement-word pair carefully, and then indicate at the end of each line which category best matches each statement-word pair using the category's corresponding number (1-10). The ten categories are listed below. There are no right or wrong answers.

The categories include:

| | | | | |
|--------------------------------------|---------------------------------------|-------------------------------|---------------------------------|---------------------------------------|
| 1 Physical harm to self | 2 Physical harm to other | 3 Health of self | 4 Health of others | 5 Romantic relationships |
| 6 Social relationships | 7 Family relationships | 8 Finances | 9 Work competence | 10 Academic performance |

- 1) Your bank statement is surprising - *Broke*..... _____
- 2) Your mother has lost a lot of weight - *Sick*..... _____
- 3) Your health has changed - *Worse*..... _____
- 4) You receive an unexpected grade on your test - *Fail*..... _____
- 5) You receive a call from a loan officer - *Decline*..... _____
- 6) The air is not clear and it is hard to see - *Smoke*..... _____
- 7) Your boss comments on your work ethic - *Lazy*..... _____
- 8) You have trouble catching your breath - *Asthma*..... _____
- 9) Your child is splashing in the water - *Drowning*..... _____
- 10) You overhear students commenting on your class presentation - *Boring*.....
..... _____
- 11) You call your mother but she can't get to the phone - *Hurt*..... _____
- 12) You are surprised when you check your credit card balance - *Large*... _____
- 13) Your child is not at school - *Missing*..... _____
- 14) Your friend reacts to your gift - *Disappointed*..... _____
- 15) Your heart is beating very quickly - *Panicked*..... _____

| | | | | |
|--------------------------------------|---------------------------------------|-------------------------------|---------------------------------|---------------------------------------|
| 1 Physical harm to self | 2 Physical harm to other | 3 Health of self | 4 Health of others | 5 Romantic relationships |
| 6 Social relationships | 7 Family relationships | 8 Finances | 9 Work competence | 10 Academic performance |

- 16) Your father is losing his hair - *Chemotherapy*..... _____
- 17) Your performance in the play was commented on by your friends - *Criticized*.
..... _____
- 18) Your ex-partner comments on how you look different now - *Ugly*..... _____
- 19) There will be major changes at your company over the next 3 years - *Fire*....
..... _____
- 20) Your relationship with your parents has changed - *Worse*..... _____
- 21) Your face is sweaty - *Fever*..... _____
- 22) You finish last of everyone on a test - *Stupid*..... _____
- 23) You help your sister tie her gown - *Hospital*..... _____
- 24) The alarm goes off - *Warning*..... _____
- 25) You visit your friend at the hospital - *Sick*..... _____
- 26) Your sibling spends less time with you than before - *Disinterest*..... _____
- 27) People laugh after something you said - *Embarrassing*..... _____
- 28) Your partner's behaviour has changed - *Uncaring*..... _____
- 29) The doctor examines your growth - *Tumor*..... _____
- 30) There is a change in your salary - *Paycut*..... _____
- 31) You are surprised when you see your blind date - *Unattractive*..... _____
- 32) Your child steps out into the street - *Collision*..... _____
- 33) Your friend comments on your behaviour - *Disapprove*..... _____
- 34) A person approaches you on the street - *Mugger*..... _____
- 35) Your father's condition is surprising given his age - *Unwell*..... _____

| | | | | |
|--------------------------|---------------------------|-------------------|---------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Physical harm to self | Physical harm to other | Health of self | Health of others | Romantic relationships |
| 6 | 7 | 8 | 9 | 10 |
| Social relationships | Family relationships | Finances | Work competence | Academic performance |

- 36) You are surprised to hear the results of your check-up – *Ill*..... _____
- 37) You receive a letter from the school you applied to - *Rejected*..... _____
- 38) You receive a letter about your income taxes - *Owe*..... _____
- 39) You hear a noise in the night - *Robber*..... _____
- 40) Your friend does not return your call promptly - *Rejecting*..... _____
- 41) Your teacher writes many comments on your essay - *Disappointed*... _____
- 42) A friend does not respond when you wave hello - *Angry*..... _____
- 43) You ask your teacher a question - *Confused*..... _____
- 44) Your financial situation has changed - *Worse*..... _____
- 45) Your date is not here yet - *No-show*..... _____
- 46) Your child is acting differently toward you - *Worsened*..... _____
- 47) Your mother is distant - *Cold*..... _____
- 48) Your father calls - *Criticize*..... _____
- 49) Your boss wants to meet with you - *Criticize*..... _____
- 50) Your manager says the quality of your work has changed - *Worse*..... _____
- 51) You and your partner are speaking loudly - *Fight*..... _____
- 52) Your supervisor thinks you are responsible - *Blame*..... _____
- 53) Your partner wants to talk - *Breakup*..... _____
- 54) Your mother's hands are shaking - *Parkinson's*..... _____
- 55) Colleagues find your views unique - *Weird*..... _____
- 56) The captain of your plane addresses the passengers - *Warning*..... _____
- 57) You have not seen your family in awhile - *Conflict*..... _____

| | | | | |
|--------------------------------------|---------------------------------------|-------------------------------|---------------------------------|---------------------------------------|
| 1 Physical harm to self | 2 Physical harm to other | 3 Health of self | 4 Health of others | 5 Romantic relationships |
| 6 Social relationships | 7 Family relationships | 8 Finances | 9 Work competence | 10 Academic performance |

58) Your partner is not home from work yet - *Accident*..... _____

59) Someone knocks at your front door - *Police*..... _____

60) The bear approaches your child - *Attack*..... _____

Appendix I

SET B STIMULUS CATEGORIZATION GRID

Statement Categorization Grid (B)

Below are a series of 60 short statements, paired with a related word in italics. Please read each statement-word pair carefully, and then indicate at the end of each line which category best matches each statement-word pair using the category's corresponding number (1-10). The ten categories are listed below. There are no right or wrong answers.

The categories include:

| | | | | |
|--------------------------------------|---------------------------------------|-------------------------------|---------------------------------|---------------------------------------|
| 1 Physical harm to self | 2 Physical harm to other | 3 Health of self | 4 Health of others | 5 Romantic relationships |
| 6 Social relationships | 7 Family relationships | 8 Finances | 9 Work competence | 10 Academic performance |

- 1) Your friend cannot be reached - *Hurt*..... _____
- 2) You cannot see the view anymore - *Blindness*..... _____
- 3) Your shirt has red stains all over it - *Blood*..... _____
- 4) Your aunt looks thinner - *Sick*..... _____
- 5) You feel dizzy and nauseous - *Flu*..... _____
- 6) Your course is difficult - *Failure*..... _____
- 7) Your friend's face is covered with a mask - *Virus*..... _____
- 8) Your partner comments on your outfit - *Insult*..... _____
- 9) Your child is shaking - *Frightened*..... _____
- 10) Your mother's car needs to be serviced - *Accident*..... _____
- 11) You wait for your mark in anticipation - *Afraid*..... _____
- 12) Your brother isn't in the picture - *Conflict*..... _____
- 13) You receive a call from your bank - *Fraud*..... _____
- 14) Your cousin cancels lunch plans for tomorrow - *Avoid*..... _____
- 15) Your doctor's office calls - *Urgent*..... _____
- 16) You hand in your exam an hour early - *Give-up*..... _____

| | | | | |
|--------------------------|---------------------------|-------------------|---------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Physical harm to self | Physical harm to other | Health of self | Health of others | Romantic relationships |
| 6 | 7 | 8 | 9 | 10 |
| Social relationships | Family relationships | Finances | Work competence | Academic performance |

- 17) You have adapted to the new work environment - *Worsened*..... _____
- 18) You haven't seen your mother in weeks - *Argument*..... _____
- 19) Your sister is beginning to look more pale - *Disease*..... _____
- 20) Red and blue lights flicker outside your house - *Police*..... _____
- 21) Your heart rate increases - *Panic*..... _____
- 22) You see the shark approach your brother - *Attack*..... _____
- 23) They are chasing you - *Thieves*..... _____
- 24) Your father takes the elevator - *Injured*..... _____
- 25) Your friend hasn't called you back - *Upset*..... _____
- 26) Your friends are discussing your outfit - *Dislike*..... _____
- 27) Your credit card balance is substantially different this month - *Less*.... _____
- 28) Your father doesn't answer your call - *Angry*..... _____
- 29) You are not sure how you will pay for your meal - *Broke*..... _____
- 30) Your teacher provides you with a lot of feedback - *Criticism*..... _____
- 31) Your friend is not attending your birthday celebration - *Rejection*..... _____
- 32) You hear a loud noise downstairs - *Gun*..... _____
- 33) You decrease your sugar intake - *Diabetes*..... _____
- 34) Your flight is suddenly cancelled - *Terrorist*..... _____
- 35) Your blind date looks surprised when he sees you - *Disappointed*..... _____
- 36) You and your partner have an important discussion – *Break-up*..... _____
- 37) Your co-worker tells you to go away - *Argument*..... _____
- 38) Your breathing changes - *Asthma*..... _____

| | | | | |
|--------------------------|---------------------------|-------------------|---------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Physical harm to self | Physical harm to other | Health of self | Health of others | Romantic relationships |
| 6 | 7 | 8 | 9 | 10 |
| Social relationships | Family relationships | Finances | Work competence | Academic performance |

- 39) You hear your supervisor is looking for you - *Criticize*..... _____
- 40) Your new job has changed your life - *Worse*..... _____
- 41) You haven't paid this month's bills - *Unable*..... _____
- 42) You decide to drop the class after a month - *Failing*..... _____
- 43) The class is silent throughout your presentation - *Bored*..... _____
- 44) Your nephew seems to be lost - *Missing*..... _____
- 45) You did not expect that from your partner - *Adultery*..... _____
- 46) A friend gives you feedback about your decision - *Criticism*..... _____
- 47) You send flowers to your friend - *Ill*..... _____
- 48) You wake up to the alarm going off - *Robber*..... _____
- 49) Your date has not arrived - *Unattracted*..... _____
- 50) You are taking care of the child – *Unhealthy*..... _____
- 51) You and your partner leave the party early - *Arguing*..... _____
- 52) You meet with your accountant to discuss your financial situation - *Debts*
..... _____
- 53) Family dinners are interesting - *Uncomfortable*..... _____
- 54) You move out of your parents' house - *Unhappy*..... _____
- 55) Your boss wants to discuss your work productivity - *Disappointed*..... _____
- 56) Your father doesn't recall the event - *Dementia*..... _____
- 57) Your position in the company has changed - *Demoted*..... _____
- 58) Your co-worker often asks you questions about your work - *Patronize*..... _____
- 59) You are startled by the amount of money in your bank account - *Little*..... _____
- 60) Your peers are watching you - *Judging*..... _____

Appendix J

DEBRIEFING FORM FOR ALL PARTICIPANTS

Reactions to Situations

Research has shown that people who worry excessively have difficulty coping with uncertainty. The goal of this study is to gain a better understanding how people low and high in worry interpret situations that are uncertain or ambiguous and the psychological factors that contribute to the way people make sense of uncertainty. The findings from this research will inform the development of new strategies to help people who struggle with excessive worry learn how to become more comfortable with uncertainty.

Your willingness to participate in this study is greatly appreciated. Your input will help advance our understanding of ways to tackle chronic worry. Our list of resources has titles of books on worry and anxiety management, as well as referral sources (please turn over this page for the list).

Contact Information: If you have any questions or concerns about this study or your participation in this study you may contact:

Dr. Michel Dugas
Associate Professor
Department of Psychology
Concordia University
(514) 848-2424 x 2215
michel.dugas@concordia.ca

You may also contact Virginia Penhune, Ph.D., chair of the Psychology Department Ethics Committee, at penhune@alcor.concordia.ca.

Or you may consult Adela Reid, Research Ethics and Compliance Officer, Concordia University, at 514-848-2424, x. 7481, or by email at Adela.Reid@Concordia.ca.

If you would like any information about the results of the study once it is complete, please contact Dr. Michel Dugas or Avital Ogniewicz at (514) 848-2424 x 2229

A note about disclosure: In order to maintain the integrity of this research, we ask that you not disclose the purpose of this study to others who may be interested in taking part in this study. When participants have too much prior knowledge about the purpose of a research study, this can influence how they respond to questions and act during a study; as a result, their data may not be usable.

Thank you very much for participating in this study!

Resources: We provide all participants who complete this study with the same list of resources, in case they are interested in learning more about worry or anxiety.

Self-Help Books for Worry:

- Hazlett-Stevens, H. (2005). *Women who worry too much: How to stop worry and anxiety from ruining relationships, work, & fun*. Oakland, CA: New Harbinger.
- Greenberger, D., & Padesky, C. A. (1995). *Mind Over Mood*. New York, NY: Guilford Press.
- Meares, K., & Freeston, M. (2008). *Overcoming worry: A self-help guide using cognitive behavioral techniques*. New York: Basic Books.

Appendix K

GENERALIZED ANXIETY DISORDER QUESTIONNAIRE FOR THE DIAGNOSTIC
AND STATISTICAL MANUAL (4TH EDITION)

GAD-Q-IV

ID#: _____

GAD-Q-IV

1. Do you experience excessive worry?.....NO.....YES.....
2. Is your worry excessive in intensity, frequency, or amount of distress it causes?.....NO.....YES.....
3. Do you find it difficult to control your worry (or stop worrying) once it begins?.....NO.....YES.....
4. Do you worry excessively and uncontrollably about **minor things** such as being late, for an appointment minor repairs, etc?.....NO.....YES.....
5. Please list the most frequent topics about which you worry excessively and uncontrollably:

| | |
|----------|----------|
| a. _____ | d. _____ |
| b. _____ | e. _____ |
| c. _____ | f. _____ |
6. During the **last six months**, have you been bothered by excessive and uncontrollable worries more days than not?.....NO.....YES.....
7. During the **last six months**, have you been bothered by restlessness or feeling keyed up or on edge more days than not?.....NO.....YES.....
8. During the **last six months**, have you been bothered by difficulty falling/staying asleep or restless/unsatisfying sleep more days than not?..NO.....YES.....

GAD-Q-IV

ID#: _____

9. During the **last six months**, have you been bothered by difficulty concentrating or your mind going blank more days than not?.....NO.....YES.....
10. During the **last six months**, have you been bothered by irritability more days than not?.....NO.....YES.....
11. During the **last six months**, have you been bothered by being easily fatigued more days than not?.....NO.....YES.....
12. During the **last six months**, have you been bothered by muscle tension more days than not?.....NO.....YES.....
13. How much do worry and physical symptoms interfere with your life, work, social activities, family, etc? Circle one **number**.

| Not at All | Mildly | Moderately | Severe | Very Severe | | | | |
|------------|--------|------------|--------|-------------|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

14. How much are you bothered by worry and physical symptoms (how much distress does it cause you)? Circle one **number**.

| No Distress | Mild Distress | Moderate Distress | Severe Distress | Very Severe | | | | |
|-------------|---------------|-------------------|-----------------|-------------|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Newman, M. G., Zuelling, A. R., Kachin, K. E., Constantino, M. J., Przeworski, A., Erickson, T., et al. (2002).

Appendix L

PENN STATE WORRY QUESTIONNAIRE

PSWQ

ID#: _____

PSWQ

Please circle a number (1 to 5) that best describes how typical or characteristic each item is of you.

- | | Not at all
typical | Somewhat
typical | Very
typical |
|---|-----------------------|---------------------|--------------------|
| 1. If I don't have enough time to do everything, I don't worry about it..... | 1..... | 2..... | 3.....4.....5..... |
| 2. My worries overwhelm me..... | 1..... | 2..... | 3.....4.....5..... |
| 3. I don't tend to worry about things..... | 1..... | 2..... | 3.....4.....5..... |
| 4. Many situations make me worry..... | 1..... | 2..... | 3.....4.....5..... |
| 5. I know I shouldn't worry about things but I just can't help it..... | 1..... | 2..... | 3.....4.....5..... |
| 6. When I'm under pressure, I worry a lot..... | 1..... | 2..... | 3.....4.....5..... |
| 7. I am always worrying about something..... | 1..... | 2..... | 3.....4.....5..... |
| 8. I find it easy to dismiss worrisome thoughts..... | 1..... | 2..... | 3.....4.....5..... |
| 9. As soon as I finish one task, I start to worry about everything else I have to do..... | 1..... | 2..... | 3.....4.....5..... |
| 10. I never worry about anything..... | 1..... | 2..... | 3.....4.....5..... |
| 11. When there is nothing more that I can do about a concern, I don't worry about it anymore..... | 1..... | 2..... | 3.....4.....5..... |
| 12. I've been a worrier all my life..... | 1..... | 2..... | 3.....4.....5..... |

| | Not at all characteristic of me | Somewhat typical | Very typical |
|---|---------------------------------------|---------------------|--------------------|
| 13. I notice that I have been worrying about things..... | 1..... | 2..... | 3.....4.....5..... |
| 14. Once I start worrying, I can't stop..... | 1..... | 2..... | 3.....4.....5..... |
| 15. I worry all the time..... | 1..... | 2..... | 3.....4.....5..... |
| 16. I worry about projects until they are all done..... | 1..... | 2..... | 3.....4.....5..... |

Meyer, T. J. , Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990).

Appendix M

INTOLERANCE OF UNCERTAINTY SCALE

ID#: _____

IUS

You will find below a series of statements which describe how people may react to the uncertainties of life. Please use the scale below to describe to what extent each item is characteristic of you. Please circle a number (1 to 5) that describes you best.

- | | Not at all
characteristic
of me | Somewhat
characteristic
of me | Entirely
characteristic
of me |
|--|---------------------------------------|-------------------------------------|-------------------------------------|
| 1. Uncertainty stops me from having a firm opinion..... | 1..... | 2..... | 3.....4.....5..... |
| 2. Being uncertain means that a person is disorganized..... | 1..... | 2..... | 3.....4.....5..... |
| 3. Uncertainty makes life intolerable..... | 1..... | 2..... | 3.....4.....5..... |
| 4. It's unfair not having any guarantees in life..... | 1..... | 2..... | 3.....4.....5..... |
| 5. My mind can't be relaxed if I don't know what will happen tomorrow..... | 1..... | 2..... | 3.....4.....5..... |
| 6. Uncertainty makes me uneasy, anxious, or stressed..... | 1..... | 2..... | 3.....4.....5..... |
| 7. Unforeseen events upset me greatly..... | 1..... | 2..... | 3.....4.....5..... |
| 8. It frustrates me not having all the information I need..... | 1..... | 2..... | 3.....4.....5..... |
| 9. Uncertainty keeps me from living a full life..... | 1..... | 2..... | 3.....4.....5..... |
| 10. One should always look ahead so as to avoid surprises..... | 1..... | 2..... | 3.....4.....5..... |
| 11. A small unforeseen event can spoil everything, even with the best of planning..... | 1..... | 2..... | 3.....4.....5..... |
| 12. When it's time to act, uncertainty paralyzes me..... | 1..... | 2..... | 3.....4.....5..... |
| 13. Being uncertain means that I am not first rate..... | 1..... | 2..... | 3.....4.....5..... |

14. When I am uncertain, I
can't go forward.....1.....2.....3.....4.....5.....

Not at all
characteristic
of me

Somewhat
characteristic
of me

Entirely
characteristic
of me

15. When I am uncertain I
can't function very well.....1.....2.....3.....4.....5.....
16. Unlike me, others always
seem to know where they
are going with their lives.....1.....2.....3.....4.....5.....
17. Uncertainty makes me
vulnerable, unhappy, or
sad.....1.....2.....3.....4.....5.....
18. I always want to know
what the future has in store
for me.....1.....2.....3.....4.....5.....
19. I can't stand being taken by
surprise.....1.....2.....3.....4.....5.....
20. The smallest doubt can
stop me from acting.....1.....2.....3.....4.....5.....
21. I should be able to
organize everything in
advance.....1.....2.....3.....4.....5.....
22. Being uncertain means that
I lack confidence.....1.....2.....3.....4.....5.....
23. I think it's unfair that other
people seem sure about
their future.....1.....2.....3.....4.....5.....
24. Uncertainty keeps me from
sleeping soundly.....1.....2.....3.....4.....5.....
25. I must get away from all
uncertain situations.....1.....2.....3.....4.....5.....
26. The ambiguities in life
stress me.....1.....2.....3.....4.....5.....
27. I can't stand being
undecided about my future.....1.....2.....3.....4.....5.....
-

Buhr, K., & Dugas, M. J. (2002); Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994)

Appendix N

AMBIGUOUS/UNAMBIGUOUS SITUATIONS DIARY, EXTENDED VERSION

ID#: _____

AUSD-EX

Imagine that the following are extracts from your diary. Read each extract and then decide whether the event would cause you concern (e.g., worry) or not. Using the scale below, circle a number (1 to 5) to indicate the degree to which you are unconcerned or concerned by each item. Please circle only one number for each diary extract. There are no right or wrong answers to this, just decide how you yourself would feel in each case.

| | | | | |
|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|-------------------------|-----------------------|-------------------------|-------------------|------------------------|

1. We had invited some friends to join us for a barbecue, but no one turned up.....1.....2.....3.....4.....5.....
2. My performance in the play was commented on by everyone.....1.....2.....3.....4.....5.....
3. I went out on a date with a colleague. I wrote him/her an e-mail to say that I enjoyed myself; I'm still waiting to hear back from him/her.....1.....2.....3.....4.....5.....
4. On my first night as a chef in the restaurant, I was called to the diners' tables twice.....1.....2.....3.....4.....5.....
5. Today, I expressed my opinion on an important matter and it was well-received.....1.....2.....3.....4.....5.....
6. I phoned the doctor today and was surprised to hear the results of last week's check-up.....1.....2.....3.....4.....5.....

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|--|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 7. My boss pulled me aside today to discuss my poor work ethic..... | 1 | 2 | 3 | 4 | 5 |
| 8. My grandfather went for a medical exam today and his family doctor told him that his condition is surprising given his age..... | 1 | 2 | 3 | 4 | 5 |
| 9. When I told my parents that I wanted to change my program of study, they reacted angrily, and said they would not approve of my decision..... | 1 | 2 | 3 | 4 | 5 |
| 10. Since moving out on my own last year, I've noticed a significant change in the way my sister and I get along..... | 1 | 2 | 3 | 4 | 5 |
| 11. Today, I was on the bus when I noticed some of my classmates sitting behind me, talking with each other in a low voice..... | 1 | 2 | 3 | 4 | 5 |
| 12. I was very surprised when I checked my bank account balance this morning..... | 1 | 2 | 3 | 4 | 5 |
| 13. Ever since I've been eating well and exercising, my energy level has increased and my concentration has never been better..... | 1 | 2 | 3 | 4 | 5 |

- | | Not at all
concerned | A little
concerned | Moderately
concerned | Very
concerned | Extremely
concerned |
|--|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 14. I know that whatever choices I make, I have the support and encouragement of my family..... | 1 | 2 | 3 | 4 | 5 |
| 15. Not only was yesterday's meal out very disappointing, but I now also think that I have food poisonin..... | 1 | 2 | 3 | 4 | 5 |
| 16. I submitted my university application and I was told that I should be receiving a response in about 2 months from now. Today, I sorted through my mail and found a letter from the university..... | 1 | 2 | 3 | 4 | 5 |
| 17. While I was out, my new boy/girlfriend called and left a message on my answering machine, saying that we need to talk about something important..... | 1 | 2 | 3 | 4 | 5 |
| 18. In the middle of my flight, the captain suddenly addressed the passengers..... | 1 | 2 | 3 | 4 | 5 |
| 19. My mother has not been feeling well for several weeks now; the results of her blood tests confirm that she has a serious illness..... | 1 | 2 | 3 | 4 | 5 |

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|--|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 20. Mom had to take my little brother to the doctor today, the doctor was going to check his growth..... | 1 | 2 | 3 | 4 | 5 |
| 21. Last weekend, my boy/girlfriend ended our relationship; this is the third time someone has left me to date someone else..... | 1 | 2 | 3 | 4 | 5 |
| 22. Today, my manager called me to their office to discuss the change in the quality of my work over the last few weeks..... | 1 | 2 | 3 | 4 | 5 |
| 23. I'm going to a family reunion this summer; I haven't spoken to most of my family in 3 years..... | 1 | 2 | 3 | 4 | 5 |
| 24. I received a letter from the bank this morning telling me that I have exceeded my overdraft limit and will have to pay quite heavy bank charges..... | 1 | 2 | 3 | 4 | 5 |
| 25. This weekend, my boy/girlfriend and I are going away to celebrate our anniversary!..... | 1 | 2 | 3 | 4 | 5 |
| 26. I got a term paper back from my professor today and was surprised at the mark it received..... | 1 | 2 | 3 | 4 | 5 |

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|---|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 27. I completed my tax returns today and the results of the assessment were not as I expected..... | 1 | 2 | 3 | 4 | 5 |
| 28. Two of my friends who graduated from the program of study I am currently enrolled in, say they have spent the last year exploring their career options..... | 1 | 2 | 3 | 4 | 5 |
| 29. As I walked along the pier, I overheard three men discussing the best way to blow up a boat..... | 1 | 2 | 3 | 4 | 5 |
| 30. I have so much work to do at the moment, and on top of all the essays that I have to write, we were told that we would be having an end of term test next week too..... | 1 | 2 | 3 | 4 | 5 |
| 31. In the middle of the night I was startled by a loud crash coming from downstairs only to discover that my cat had overturned a vase on the windowsill..... | 1 | 2 | 3 | 4 | 5 |
| 32. My summer job applications are going very well, so far I have been offered second interviews by all three of the companies I'd most like to work for..... | 1 | 2 | 3 | 4 | 5 |
| 33. The teams for the | 1 | 2 | 3 | 4 | 5 |

volleyball competition
were announced today,
I can't believe that I
have been picked to
play for the second
team.....

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|--|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 34. While talking to them, I was surprised at the convictions of one of my friends from work. | 1..... | 2..... | 3..... | 4..... | 5..... |
| 35. While watching a film in a movie theatre, I felt my breath catch in my throat..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 36. My life seems so unpredictable; I never quite know what is going to happen next, and I am often surprised by the way situations turn out for me..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 37. I was concerned about not being able to pay my tuition, but I just found out that not only was I approved for a student loan, I will be receiving a bursary as well..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 38. While on my way out tonight, I was stopped in the street..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 39. As I have been getting older, I have experienced many changes in the quality of my friendships..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 40. When I introduced my new boy/girlfriend to my mom and sister, they seemed very surprised..... | 1..... | 2..... | 3..... | 4..... | 5..... |
| 41. I went to the | 1..... | 2..... | 3..... | 4..... | 5..... |

hairdresser's this
morning, my new
hairstyle is atrocious, I
look awful.....

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|---|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 42. While I was away, someone broke into my apartment and stole most of my belongings..... |1..... |2..... |3..... |4..... |5..... |
| 43. Today, the professor who teaches my favourite course, asked to meet with me to discuss his evaluation of the essay I turned in last week..... |1..... |2..... |3..... |4..... |5..... |
| 44. I went jogging with my mother yesterday and I noticed she often had to stop to catch her breath..... |1..... |2..... |3..... |4..... |5..... |
| 45. I went to Amanda's party last night, it was fun!..... |1..... |2..... |3..... |4..... |5..... |
| 46. The new person I've been dating told me last night, that our relationship is so different from ones they've had in the past. |1..... |2..... |3..... |4..... |5..... |
| 47. Our boss at work discussed the company's poor performance and agreed that I was the most responsible..... |1..... |2..... |3..... |4..... |5..... |
| 48. This semester, I got straight A's in all my courses and made it onto the Dean's List.... |1..... |2..... |3..... |4..... |5..... |
| 49. My mother went to see her family doctor 2 |1..... |2..... |3..... |4..... |5..... |

weeks ago. She called
me today to tell me
that her tests indicate
that her health is the
best it has been in
years.....

| | Not at all concerned | A little concerned | Moderately concerned | Very concerned | Extremely concerned |
|---|-------------------------|-----------------------|-------------------------|-------------------|------------------------|
| 50. I saw my doctor for my annual medical check-up. The clinic nurse left a message on my answering machine, asking me to call her back..... |1..... |2..... |3..... |4..... |5..... |
| 51. My supervisor called a team meeting today to announce that there will be some major changes in our company over the next 5 years..... |1..... |2..... |3..... |4..... |5..... |
| 52. Today, I saw my friend walking down the street with a group of peers; I waved at her, but she walked on without stopping..... |1..... |2..... |3..... |4..... |5..... |
| 53. Next month, after graduation, I will be moving to the city I've always wanted to live in, to start a job that suits my interests and experience perfectly.... |1..... |2..... |3..... |4..... |5..... |
| 54. Last week, I went to the bank to request a loan to help pay my tuition; I was surprised at the amount they were willing to lend me..... |1..... |2..... |3..... |4..... |5..... |
| 55. So far, I've received rejection letters from all the schools I applied to in the last 2 years. Because of this, I will not be able to |1..... |2..... |3..... |4..... |5..... |

get a job in the field I
am interested in as a
career.....

Koerner, N., & Dugas, M. J. (2008).

Appendix O

STATE-TRAIT INVENTORY FOR COGNITIVE AND SOMATIC ANXIETY, TRAIT
SCALE

STICSA-T

ID#: _____

STICSA-T

Below is a list of statements which can be used to describe how people feel. Beside each statement are four numbers which indicate how often each statement is true of you (e.g. 1 = almost never, 4 = almost always). *Please read each statement carefully and circle the number which best indicates how often, in general, the statement is true of you.*

| <i>In general...</i> | Almost never | Occasionally | Often | Almost always |
|---|-----------------|--------------|--------|------------------|
| 1. My heart beats fast..... | 1..... | 2..... | 3..... | 4..... |
| 2. My muscles are tense..... | 1..... | 2..... | 3..... | 4..... |
| 3. I feel agonised over my problems..... | 1..... | 2..... | 3..... | 4..... |
| 4. I think that others won't approve of me..... | 1..... | 2..... | 3..... | 4..... |
| 5. I feel like I'm missing out on things because I can't make up my mind soon enough..... | 1..... | 2..... | 3..... | 4..... |
| 6. I feel dizzy..... | 1..... | 2..... | 3..... | 4..... |
| 7. My muscles are weak..... | 1..... | 2..... | 3..... | 4..... |
| 8. I feel trembly and shaky..... | 1..... | 2..... | 3..... | 4..... |
| 9. I picture some future misfortune..... | 1..... | 2..... | 3..... | 4..... |
| 10. I can't get some thoughts out of my mind..... | 1..... | 2..... | 3..... | 4..... |

| | Almost never | Occasionally | Often | Almost always |
|---|-----------------|--------------|--------|------------------|
| 11. I have trouble remembering things..... | 1..... | 2..... | 3..... | 4..... |
| 12. My face feels hot..... | 1..... | 2..... | 3..... | 4..... |
| 13. I think the worst will happen..... | 1..... | 2..... | 3..... | 4..... |
| 14. My arms and legs feel stiff..... | 1..... | 2..... | 3..... | 4..... |
| 15. My throat feels dry..... | 1..... | 2..... | 3..... | 4..... |
| 16. I keep busy to avoid uncomfortable thoughts..... | 1..... | 2..... | 3..... | 4..... |
| 17. I can't concentrate without irrelevant thoughts intruding..... | 1..... | 2..... | 3..... | 4..... |
| 18. My breathing is fast and shallow..... | 1..... | 2..... | 3..... | 4..... |
| 19. I worry that I cannot control my thoughts as well as I would like to..... | 1..... | 2..... | 3..... | 4..... |
| 20. I have butterflies in my stomach..... | 1..... | 2..... | 3..... | 4..... |
| 21. My palms feel clammy..... | 1..... | 2..... | 3..... | 4..... |

Ree, M. J., French, D., MacLeod, C., & Locke, V. (2008).

Appendix P

CENTER FOR EPIDEMIOLOGICAL STUDIES DEPRESSION SCALE

ID#: _____

CES-D

Below is a list of the ways you might have felt or behaved. Please read each statement carefully and, using the scale below, circle a number (0 to 3) to indicate how often you have felt this way **during the past week**.

| | Rarely or none of the time (Less than 1 day) | Some or a little of the time (1-2 days) | Occasionally or a moderate amount of the time (3-4 days) | Most or all of the time (5-7 days) |
|--|--|---|--|--|
| 1. I was bothered by things that usually don't bother me. |0..... |1..... |2..... |3..... |
| 2. I did not feel like eating; my appetite was poor. |0..... |1..... |2..... |3..... |
| 3. I felt that I could not shake off the blues even with help from my family or friends. |0..... |1..... |2..... |3..... |
| 4. I felt that I was just as good as other people. |0..... |1..... |2..... |3..... |
| 5. I had trouble keeping my mind on what I was doing. |0..... |1..... |2..... |3..... |
| 6. I felt depressed. |0..... |1..... |2..... |3..... |
| 7. I felt that everything I did was an effort. |0..... |1..... |2..... |3..... |

| | Rarely or none of the time (Less than 1 day) | Some or a little of the time (1-2 days) | Occasionally or a moderate amount of the time (3-4 days) | Most or all of the time (5-7 days) |
|---|--|---|--|--|
| 8. I felt hopeful about the future. |0..... |1..... |2..... |3..... |
| 9. I thought my life has been a failure. |0..... |1..... |2..... |3..... |
| 10. I felt fearful. |0..... |1..... |2..... |3..... |
| 11. My sleep was restless. |0..... |1..... |2..... |3..... |
| 12. I was happy. |0..... |1..... |2..... |3..... |
| 13. I talked less than usual. |0..... |1..... |2..... |3..... |
| 14. I felt lonely. |0..... |1..... |2..... |3..... |
| 15. People were unfriendly. |0..... |1..... |2..... |3..... |
| 16. I enjoyed life. |0..... |1..... |2..... |3..... |
| 17. I had crying spells. |0..... |1..... |2..... |3..... |
| 18. I felt sad. |0..... |1..... |2..... |3..... |
| 19. I felt that people dislike me. |0..... |1..... |2..... |3..... |
| 20. I could not get going. |0..... |1..... |2..... |3..... |