A MEASURE OF INTERPRETATION BIAS IN POSTTRAUMATIC STRESS DISORDER

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A Measure of Interpretation Bias in Posttraumatic Stress Disorder

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DEDICATION

This thesis is dedicated to everyone who has helped, encouraged, and pushed me along the way. I thank my friends, fiancée, and family, thank you for their unfaltering support. To my mentor, thank you for facilitating everything that I know today, and establishing a precedent to ensure future success.
ABSTRACT OF THE THESIS

A Measure of Interpretation Bias in Posttraumatic Stress Disorder
by
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Master of Arts in Psychology
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Researchers have developed methods of measuring interpretation of ambiguous situations in anxious individuals. However, to our knowledge, no measure exists that would allow the examination of benign (i.e., non-threatening) and threat interpretations in individuals with Posttraumatic Stress Disorder (PTSD). The present study outlines the development and validation of such a measure. Using a word-sentence association paradigm (e.g., WSAP,) 202 individuals provided ratings of how well they felt benign and threat words relate to thirteen ambiguous scenarios. Results revealed that individuals with high PTSD symptoms (n = 64) rated threat words as significantly more related to ambiguous sentences than did worry/dysphoric (n = 68) or non-worry/non-dysphoric (n = 70) individuals. We also calculated an interpretation bias by subtracting the relatedness rating for threat words from the relatedness rating for benign words. Thus larger scores revealed a benign bias, or a tendency to endorse that benign words are more related to ambiguous scenarios than threat words. Due to the increased endorsement of threat words in the PTSD group, they displayed a significantly smaller benign bias than did the other two groups. Our results provide additional evidence for an interpretation bias in individuals experiencing PTSD symptoms, as well as suggest possible implications for the distinction of benign and threat components in cognitive models of PTSD. Furthermore, the current study serves as preliminary evidence of the usefulness of the Word-Sentence Association Paradigm for Posttraumatic Stress Disorder (WSAPTS) as a brief symptom measure for PTSD.
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CHAPTER 1

INTRODUCTION

POSTTRAUMATIC STRESS DISORDER

Posttraumatic Stress Disorder (PTSD) has an estimated lifetime prevalence rate of 6.8% in the American population (Kessler et al., 2005). PTSD is characterized by symptoms such as intrusive thoughts, emotional numbing, avoidance, and hypervigilance, lasting for more than a month following a traumatic or distressing event (American Psychiatric Association [APA], 2013). Information processing models of PTSD suggest that disorder-relevant (i.e., threatening) information are given processing preference, therefore hindering one's ability to respond to task-relevant non threat stimuli necessary for daily functioning. These cognitive processes include a bias for interpreting ambiguous information as threatening (Chemtob, Roitblat, Hamada, Carlson, & Twentyman, 1988; Litz & Keane, 1989; Matthews & MacLeod, 2002), as well as bias for attending to threat relevant information. These biases result in a positive feedback loop of hypervigilance for threatening information, leading to interpretation of ambiguous information as threatening and finally symptoms of PTSD.

These theories focus on the maladaptive cognitive processes of individuals experiencing PTSD symptoms, but are largely specific to threat stimuli. However, it is not clear whether individuals with and without PTSD interpret benign (i.e., non-threatening) information differently. For instance, it seems clear that an individual with PTSD is more likely to interpret a person exiting a dark alley as a likely threat; but was this person simply a pedestrian passing in a busy crosswalk would this still be the case? Presented with either scenario both threat and benign interpretations compete for cognitive resources, and based on current models of PTSD it makes sense that the threatening one would win out. This does not necessarily mean that the ability to interpret benign information presented in isolation is impaired however; simply that it is given less salience in an environment with ambiguous cues.
STUDIES WITH AMBIGUOUS STIMULI

The majority of information processing studies of PTSD have utilized paradigms probing attentional biases (e.g., Bryant & Harvey, 1997). However, another domain of information processing bias that may be relevant in PTSD is interpretation, specifically whether ambiguous stimuli are interpreted as threatening. To examine interpretation bias in PTSD, Kimble and colleagues (2002) asked twenty-eight veterans with and without PTSD to view a series of audiovisual scenes containing neutral and military scripts (Keane et al., 1998). Participants then completed a 33-item sentence completion questionnaire and were instructed to read an ambiguous sentence (e.g., 'He was almost hit by a ‘____’), and insert the first word that came to mind. Compared to veterans who did not meet diagnostic criteria for PTSD, those with PTSD completed significantly more sentences with a military-related word (e.g., 'bullet') than a neutral word (e.g., 'rock'). Moreover, this increased tendency to complete ambiguous sentences with threat stimuli is consistent with cognitive models of PTSD (Chemtob et al., 1988), that posit individuals with PTSD either retrieve more readily or suppress less frequently, information related to their trauma.

Amir, Coles, and Foa (2002) used a modified homograph paradigm to examine inhibition of threat-relevant interpretations. These researchers used homographs (i.e., words with the same spelling but two potential meanings; e.g. arms) with one benign meaning and one threatening meaning. Participants with and without PTSD were instructed to read a sentence (e.g., ‘The rookie got a hit’) and decided whether a homograph (e.g., ‘SMACK’), presented either 100 or 850 ms after the presentation of the sentence, was related to the meaning of the sentence. Individuals with PTSD were faster to respond to threat-meanings of homographs during the automatic stage of information processing (i.e., presentation at 100 ms), but slower to respond during the strategic stage of information processing (i.e., presentation at 850 ms). These authors concluded that these results suggest that interpretation bias in PTSD is evident during the strategic (slow) stage of information processing. Thus, although individuals with PTSD may inhibit threatening stimuli on an automatic level, given enough time to process and interpret the information they are more likely to give preferential cognitive processing to that same stimuli rather than the task at hand.

Elwood, Williams, Olatunji, and Lohr (2007) used video clips of ambiguous social situations to assess interpretation bias in PTSD. Participants who had reported experiencing
interpersonal-violence rated video clips depicting threatening situations as increasing in risk more rapidly; positive situations as being potentially more risky; and positive situations as more predictable than those who did not report any experience of interpersonal violence. These authors concluded that victims of interpersonal trauma there is an ongoing sense of threat in stimuli associated with their trauma.

These studies support current theories based on threat interpretation in PTSD, but do little to provide evidence regarding benign interpretations. Therefore, a paradigm capable of measuring interpretation of benign and threat stimuli in isolation of one another would be helpful in understanding whether individuals with and without PTSD interpret these two types of stimuli in comparable ways. The distinction between these two types of biases has been explored in social anxiety (SA; Beard & Amir, 2009; Huppert, Foa, Furr, Filip, & Matthews, 2003) but not yet PTSD. To understand these cognitive processes independently would advance cognitive models of PTSD, and could have further implications for cognitive therapies.
CHAPTER 2

WORD-SENTENCE ASSOCIATION PARADIGM

Beard and Amir (2009) developed the Word-Sentence Association Paradigm (WSAP) to examine independent contributions of threat and benign interpretations in anxiety. For example, in one study these researchers asked socially anxious (SA) individuals to rate ambiguous sentences (e.g., "Your date has to leave early") as to how related they were to a socially threatening (e.g. "bored") or neutral (e.g., "busy") word. Using both threatening and benign primes separately allowed the investigators to calculate independent measures of threat and benign biases from an individual's endorsement rates of each word type.

All participants rated the benign words as more related to the sentences than they did threat words, suggesting that people generally have a bias for interpreting ambiguous information as benign. However, compared to non-anxious controls, individuals with SA rated the threat interpretations as more related to the ambiguous sentence, resulting in less of a benign bias (i.e., difference in endorsement of benign and threat interpretations) when encountering ambiguous social scenarios. Correlational analyses revealed that levels of social anxiety were significantly related to endorsement of threatening interpretations and benign interpretations. These results provide evidence for distinct measures of the constructs of benign and threat interpretations. Researchers have replicated these results in individuals with depressive symptoms (Hindash & Amir, 2012), obsessive-compulsive disorder symptoms (OCD; Kuckertz, Amir, Tobin, & Najmi, 2013), and in patients with social anxiety disorder (SAD; Amir, Prouvost, & Kuckertz, 2012) using disorder specific ambiguous information.

In the present study we aimed to develop and validate a measure of interpretation bias for individuals experiencing PTSD symptoms. To test this measure, we compared a group of individuals with PTSD symptoms to a group of individuals who did not report worry or depressive symptoms. We used a measure of worry for comparison because worry is most correlated with generalized anxiety disorder (GAD), and both analogue and clinical samples of GAD are more likely than controls to report exposure to a potentially traumatizing event
(Roemer, Molina, Litz, & Borkovec, 1996), increasing the likelihood of symptom overlap between GAD and PTSD. One example of this is GAD and PTSD are often comorbid with major depressive disorder (MDD; Kaufman & Charney, 2000), and both disorders in combination with MDD have been linked to decreased quality of life (Mittal, Fortney, Pyne, Edlund, & Wetherell, 2006). Therefore, to test the specificity of the measure we also assessed a group matched to the PTSD group on measure of worry and depression.

Consistent with previous studies using the WSAP, we hypothesize that individuals with symptoms of PTSD would rate threat words as more related to ambiguous sentences than individuals experiencing similar levels of worry and depressive symptoms, who in turn would rate threat words as more related to ambiguous sentences than a non-worry/non-depressed sample.

**METHOD**

Individuals were selected based on their responses to a series of questionnaires administered to a larger analogue sample (n = 620) at San Diego State University. All individuals received course credit for completing the Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990, see measures), Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996), and the PTSD CheckList (PCL-C; Weathers, Litz, Herman, Huska, & Keane, 1993). Participants (n = 202) were selected based on their scores on our measures of depression, worry, and PTSD. Specifically, those in the PTSD group had elevated posttraumatic stress symptoms (PTSD; n = 64). Those in the mixed high worry/dysphoric group (MWD; n = 68) were matched to the PTSD group on our measures of worry and depression but had few PTSD symptoms. Finally, those in the non-worry/dysphoric control group did not endorse elevated symptoms of worry, depression, or PTSD (NWD; n = 70).

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1We also administered a subset of items (1, 3, 9, 10, 13, 16, 18) from the Spielberger State-Trait Anxiety Scale- Trait version (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Examination of the data using this subset of the STAI-T to classify participants resulted in identical results, and are therefore not reported here.
To create a clinically relevant sample representative of PTSD, we assigned individuals to the PTSD group if they were at or above the suggested PCL-C cut-off for diagnostic screening (> 49; Lang & Stein, 2005). We assigned participants to the NWD group if they were one or more standard deviations away from the PCL-C average of a previous PTSD sample (< 30; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996); at or below the average PSWQ score of a previously established control group (< 30; Behar, Alcaine, Zuellig, & Borkovec, 2003); and fell within the ‘normal range’ (< 9) for BDI-II scores as suggested by Beck, Steer, and Carbin (1988). Finally, we selected participants to comprise the MWD group such that they were matched, on average, to our PTSD group for symptoms of worry (PSWQ) and depression (BDI-II), but differed in PTSD symptoms (PCL-C). The mean group scores for each of these measures are presented in Table 1 (pg. 8).

Self-Report Measures

The PTSD CheckList-Civilian (PCL-C; Weathers et al., 1993) is a 17-item measure of the diagnostic criteria specified by the DSM-IV for PTSD. The PCL-C has demonstrated excellent psychometric properties in an analog sample with $a = .91$ (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008). The Beck Depression Inventory-second version (BDI-II) is a measure of depression severity, assessing mood as well as cognitive and physical aspects of depression (Beck et al., 1996). It also demonstrates good psychometric properties, with $a = .89$ (Steer & Clark, 1997).

The Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) is a 16-item measure of pathological worry designed to evaluate the generality, excessiveness, and uncontrollability that are characteristic of generalized anxiety disorder. It has demonstrated good psychometric properties, with $a = .90$ (Fresco, Heimberg, Mennin, & Turk, 2002).

The Word-Sentence Association Paradigm for Posttraumatic Stress Disorder (WSAPTSD) is a 26-item measure of interpretation bias for benign and threat words as they relate to ambiguous scenarios (see Appendix). Thirteen scenarios are described in a sentence, once paired with a benign (i.e., neutral or positive; anything non-threatening) word and once paired with a threat word, for a total of 26 word-sentence pairs. Participants are instructed to indicate on a 5-point Likert scale how related the paired word is to the sentence depicting the ambiguous scenario. For instance, if the scenario, “You go to the beach” is paired with the
word “fun”, an individual would indicate a “1” if they thought that this would not be a fun scenario at all; likewise, they would indicate a “5” if they thought this would be an extremely fun scenario.

The 26 items that comprise this measure were selected from a larger set that had been created by researchers and therapists familiar with PTSD cognitions. Overall, this set contained 30 ambiguous sentences, each presented separately with a benign or threat word pairing. In a pilot study we administered these 60 items, as well as the PCL-C to measure PTSD symptoms, in a separate sample of 260 unselected participants. Six of these ambiguous sentences were eliminated because the sentence stem's bias score (benign rating – threat rating) was not correlated to PCL-C scores ($r < 0.12$, $p > .05$). The remaining 24 sentences were evaluated for how well they differentiated (all $t$’s $> 2.50$, $p < .05$) individuals scoring low ($< 24$) or high ($> 52$) on the PCL-C, resulting in 11 sentences being eliminated. The final measure comprised 13 sentences, each with a benign and threat word pair, totaling 26 items. These remaining 26 items demonstrated good internal consistency in the current sample, $a = .855$.

**RESULTS**

Our three groups did not differ on mean age [$F(2, 198) = 0.99$, $p = .373$]) or gender ratio [$X^2(2) = 3.63$, $p = .163$]. However, as expected groups differed significantly on PCL-C [$F(2, 199) = 646.22$, $p < .001$], PSWQ [$F(2, 199) = 226.60$, $p < .001$], and BDI-II [$F(2, 199) = 153.03$, $p < .001$] scores (See Table 1). Follow up $t$ tests revealed that the PTSD group reported significantly more PTSD symptoms than both the MWD group [$t(130) = 19.01$, $p < .001$] and the NWD group [$t(132) = 39.84$, $p < .001$]. The MWD group also endorsed significantly more PTSD symptoms than the NWD group [$t(136) = 14.79$, $p < .001$]. The PTSD group and MWD group did not differ significantly in worry [$t(130) = 1.05$, $p = .295$] or depressive symptoms [$t(130) = 1.02$, $p = .311$]. However, the NWD group reported significantly lower worry than the PTSD [$t(132) = 19.48$, $p < .001$] and MWD [$t(136) = 21.77$, $p < .001$] groups, as well as less depressive symptoms than the PTSD [$t(132) = 14.50$, $p < .001$] and MWD [$t(136) = 23.26$, $p < .001$] groups.
Table 1. Demographics and Questionnaire Data

<table>
<thead>
<tr>
<th></th>
<th>NWD (n = 70)</th>
<th>MWD (n = 68)</th>
<th>PTSD (n = 64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Female</td>
<td>61.43&lt;sup&gt;a&lt;/sup&gt;</td>
<td>76.47&lt;sup&gt;a&lt;/sup&gt;</td>
<td>68.25&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Age</td>
<td>19.13 (1.79)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.82 (1.12)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.14 (1.46)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>BDI-II</td>
<td>2.27 (1.83)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17.51 (5.16)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>18.84 (9.37)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>PSWQ</td>
<td>25.54 (3.25)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>46.35 (7.29)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>47.84 (8.96)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>PCL-C</td>
<td>20.33 (3.46)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>34.06 (6.93)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>56.69 (6.73)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Threat</td>
<td>1.40 (.34)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.13 (.57)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.91 (.49)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benign</td>
<td>3.18 (.68)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.22 (.68)&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>3.43 (.55)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bias</td>
<td>1.77 (.71)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.08 (.87)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.53 (.67)&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Word Ratings Analysis**

Next we conducted a 3 (Group: PTSD, MWD, NWD) x 2 (Word type: threat, benign) mixed model ANOVA with repeated measures on the second factor. Results revealed significant main effects of Group [$F(2, 199) = 73.18, p < .001$] and Word type [$F(1, 199) = 446.27, p < .001$], that were qualified by a Group x Word type interaction [$F(2, 199) = 45.57, p < .001$].

To examine this interaction further, we compared groups on each word type. These analyses revealed that groups differed significantly in their rating of relatedness for threat words [$F(2, 199) = 165.51, p < .001$], and marginally for benign words [$F(2, 199) = 2.94, p = .055$]. Follow up $t$ tests revealed that the PTSD group rated threat words as significantly more related to the ambiguous sentences than did the MWD [$t(130) = 8.26, p < .001$] and the NWD [$t(132) = 20.68, p < .001$] groups. However, compared to the NWD group the MWD group rated threat words [$t(136) = 9.13, p < .001$] as significantly more related to ambiguous sentences (see Figure 1).

The PTSD group also rated benign words as more related to ambiguous sentences compared to the NWD group [$t(132) = 2.36, p = .02$], and marginally so compared to the MWD group [$t(130) = 1.95, p = .053$]. However, these groups were not significantly different in their rating of benign words [$t(136) = .34, p = .728$].
Consistent with previous research, we calculated a benign interpretation bias score by subtracting the mean threat related ratings from the mean benign related ratings. We then compared the three groups on their benign bias scores. There was a significant effect of group \[F(2, 199) = 45.57, p < .001\]. Follow up t tests revealed that the PTSD group had a significantly lower benign bias than both the MWD \[t(130) = 4.10, p < .001\] and NWD \[t(132) = 10.39, p < .001\] groups (see Figure 1). The MWD group also had a significantly lower benign bias than the NWD group \[t(136) = 5.10, p < .001\].

**Regression Analysis**

To examine the predictive utility of our bias index, we conducted a linear regression predicting PCL-C scores using the benign bias, PSWQ, and BDI-II scores. This analysis revealed that these predictors accounted for a significant proportion of the variance in the model \[F(3,198) = 83.22, p < .001, R^2 = .558\]. Standardized coefficients revealed that the benign bias \((b^* = -0.28, t = -5.05, p < .001)\) PSWQ \((b^* = .31, t = 4.47, p < .001)\) BDI-II \((b^* = .29, t = 4.0, p < .001)\) each significantly predicted PCL-C when controlling for the remaining variables.
CHAPTER 3

DISCUSSION

In this study we examined the role of interpretation bias in individuals reporting of PTSD symptoms. The WSAPTSD demonstrated good internal consistency in our overall sample. Moreover, the WSAPTSD provided independent rating of interpretation tendencies of individuals reporting high PTSD symptoms. Benign interpretations, threat interpretations, and the difference of these two ratings (i.e., benign bias) differentiated individuals with PTSD symptoms from a non-worry/dysphoric control group, as well a matched-worry/dysphoric control group.

Consistent with previous research (e.g., Beard & Amir, 2009; Kuckertz et al., 2013) all groups had higher average ratings of benign words than threat words. Kuckertz et al. (2013) suggested that this is possibly due to greater familiarity or more frequent exposure to benign words compared to threat words for all participants. This can be confirmed by searching WSAPTSD stimuli in an online corpus of word frequency with parameters set between 1980-2008 (Google books Ngram Viewer; Michel et al., 2011). Although not all benign words report higher raw frequencies than all threat words, this relationship is true on average. An independent sample t-test confirmed that WSAPTSD benign stimuli (M = 0.007, SD = 0.007) appear significantly more often in this general corpus of literature than WSAPTSD threat stimuli (M = 0.001, SD = 0.002; t(24) = 3.19, p = .004).

Consistent with our hypothesis, individuals with PTSD symptoms rated threat words as being significantly more related to ambiguous sentences than the NWD and MWD groups. Although it is possible that higher average ratings for both benign and threat words are attributable to a general confirmation bias, the format of the WSAPTSD suggests this is not the case. In spite of higher average benign ratings in the PTSD group, their smaller benign bias score suggests that a general response bias is not a likely explanation for our results. These data also are consistent with the hypothesis that when examining interpretation bias in psychopathology, it is important to access both threat and benign interpretation independently. Indeed the most sensitive measure of interpretation bias was the difference...
score of benign and threat word ratings in individuals experiencing symptoms of PTSD. Consistent with this observation, the benign interpretation bias was a significant predictor of PTSD symptoms.

Because many symptoms of PTSD overlap with those of anxiety and mood disorders, we expected that our PTSD group would also report elevated levels of worry (i.e., PSWQ scores) and depression (i.e., BDI-II scores). To rule out the possibility that differences in interpretation tendencies between our PTSD group and NWD group were due to these more general symptoms, we included an MWD as a second control, and matched them to the PTSD on both self-report measures. Controlling for these factors provides necessary evidence to suggest that the WSAPTSD is specific to symptoms of PTSD, and not other comorbid symptoms of worry or depression.

One extension of our work would be to use the WSAPTSD stimuli in a computerized interpretation assessment task so that data regarding reaction time to select an item is also collected. Moreover, it is possible to use these stimuli to develop computerized interpretation training software that could be used as a treatment for PTSD, as has been done with other clinical conditions. For example, cognitive bias modification for interpretation biases (CBM-I) has demonstrated reduced negative symptoms in GAD (Hayes, Hirsch, Krebs, & Matthews, 2010), OCD (Clerkin & Teachman, 2011; Williams & Grisham, 2013), and SAD (for review, see Mobini, Reynolds, & Mackintosh, 2013).

While these results extend our understanding of interpretation tendencies in individuals experiencing PTSD symptoms, our study has limitations. Conducting this study in an analogue sample does not allow us to generalize these results to a population of individuals with a diagnosis of PTSD. The average PCL-C score for our PTSD group was 56.69 (6.73), which is within a single standard deviation of clinical scores in previous studies of mixed trauma samples (Blanchard et al., 1996). This also fell above the suggestions for a clinical cut-off of 44 or 50 (Blanchard et al., 1996; Lang & Stein, 2005). As such, we can be confident to have identified individuals who are representative of a clinical PTSD sample based on the demonstrated specificity of these cut-offs. Nevertheless, our results should be replicated in a clinical sample. The stimuli that comprise the WSAPTSD were designed to generalize as much as possible to traumatic threat, and not to any one specific type of trauma. It was inevitable however, that some stimuli (e.g., "attacker") may not be relevant to certain
types of trauma (e.g., motor-vehicle accident). Paired with information regarding type of trauma (e.g., assault, motor-vehicle accident, combat), the WSAPTS could be evaluated as to whether it generalizes across a broad spectrum of "traumatic events," or if it is specific to any particular experiences. In either case, there exists the possibility of developing additional stimuli for use in this paradigm that would highlight differences specific to a certain traumatic experience.

These limitations notwithstanding, the WSAPTS provides a means of examining specific interpretation biases in PTSD. Because it is easily administered it can also be a brief and cost-effective clinical assessment tool.
REFERENCES


APPENDIX

THE WORD-SENTENCE ASSOCIATION PARADIGM FOR POSTTRAUMATIC STRESS DISORDER
WSAPTS

Below are a list of sentences, and a word associated with that sentence. Please read each sentence along with the word paired next to it. Then circle a number indicating how related the sentence and the word are to each other for you personally. When making your decision please use the scale below to rate their degree of relatedness.

For example: if the sentence is “You plan a fun activity for the weekend” and the word is “beach”, and you think that going to the beach would be a fun activity so they are very much related you would circle ‘5’. However, if you think that going to the beach would not be a fun activity, you would circle ‘1’. Please be sure to consider using all five points on the scale (1 through 5).

1 = not related  2 = a little related  3 = somewhat related  4 = quite related  5 = extremely related

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Word</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A past memory suddenly comes to mind.</td>
<td>Scared</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. A stranger behind you in line is close to you.</td>
<td>Agitated</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. A conversation triggers a memory.</td>
<td>Past</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. You have to read directions a second time.</td>
<td>Racing Thoughts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. You picture a scenario in your mind.</td>
<td>Upset</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. You are invited to a party.</td>
<td>Fun</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. You have memories about a place.</td>
<td>Horror</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. You are reminded of a past event.</td>
<td>Distraught</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. You become frustrated.</td>
<td>Breathe</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. You think of someone you haven’t seen in a while.</td>
<td>Terror</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. You think of a face you are familiar with.</td>
<td>Friend</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. You are invited to the movies but do not want to go.</td>
<td>Money</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. You are in a public place.</td>
<td>Event</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. You picture a scenario in your mind.</td>
<td>Story</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. You become frustrated.</td>
<td>Outburst</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. You are invited to the movies but do not want to go.</td>
<td>Withdrawn</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. You think of someone you haven’t seen in a while.</td>
<td>Miss</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Number</td>
<td>Event Description</td>
<td>Emotion</td>
<td>Rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>You are reminded of a past event.</td>
<td>Friends</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>A past memory suddenly comes to mind.</td>
<td>Happy</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>You have memories about a place.</td>
<td>Pleasant</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>A conversation triggers a memory.</td>
<td>Traumatic</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>A stranger behind you in line is close to you.</td>
<td>Lunch Rush</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>You think of a face you are familiar with.</td>
<td>Attacker</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>You have to read directions a second time.</td>
<td>Comprehend</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>You are invited to a party.</td>
<td>Avoid</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>You are in a public place.</td>
<td>Over-alert</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>