

# Validation of the Safety Behavior Assessment Form – PTSD Scale

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## Abstract

Safety behaviors are core cognitive and behavioral components involved in the onset, maintenance, and treatment of anxiety-related disorders. Yet, these behaviors remain understudied in the context of posttraumatic stress disorder (PTSD). This may be due, in part, to the lack of psychometrically valid instruments designed to evaluate safety behaviors, particularly those relevant to the diagnosis of PTSD. Furthermore, there is an absence of PTSD-related safety behavior measures with the brevity necessary for continuous measurement-based care during treatment. Our research aims to investigate the psychometric characteristics of the newly formed PTSD scale of the Safety Behavior Assessment form (SBAF-PTSD) through three studies. The first study examined SBAF-PTSD factorial validity via confirmatory factor analyses (CFA), along with other psychometric properties. Results identified a 10-item bi-factor model that reflects a primary Safety Behavior scale and a secondary, latent construct labeled SBAF-PTSD Social Index. The newly revised SBAF-PTSD scale was then used in an effectiveness study to investigate its clinical utility in the context of PTSD treatment. The third study sought to generalize our results to non-clinical samples. The results of the studies are discussed in terms of their implications for the use of the new PTSD-SBAF measure.

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### Abstract

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*Keywords* : [measurement, safety behaviors, PTSD, veterans]

### Introduction

Safety behaviors are actions and mental processes that people engage in to avoid feared outcomes (Salkovskis, 1991). They manifest in various forms ranging from seeking reassurance or carrying medications to social

evasion and escape. While many safety behaviors are idiosyncratic, different disorders tend to have “typical” safety behaviors. For example, safety behaviors in social anxiety tend to include self- and social vigilance related to fears of negative evaluation (Piccarillo et al., 2015), and in generalized anxiety, they often take the form of reassurance-seeking and general control strategies related to minimizing uncertainty (Brown & Tung, 2019). PTSD-safety behaviors include situational vigilance and avoidance related to external threats (Dunmore et al., 1999), while panic disorder safety behaviors tend to be around bodily vigilance and strategies to reduce arousal (Clark, 2001).

Safety behaviors are well-recognized in anxiety-related disorders (Clark, 2001); however, fewer studies have investigated them within the context of PTSD. An exception was an excellent study by Dunmore and colleagues, who followed traumatized participants after ER visits and found that those who engaged in safety behaviors were more likely to develop PTSD, and their symptoms were more severe (1999). Despite these early findings, surprisingly few measurement options exist for assessing PTSD-related safety behaviors (Helbig-Lang & Pettermann, 2010). This, in part, led Goodson and colleagues (2016) to create the Safety Behavior Assessment Form (SBAF). The SBAF is a broad measure of safety behaviors relevant to anxiety and trauma disorders. The measure has excellent psychometric properties, including internal consistency and test-retest reliability (e.g., .91 and .76, respectively), predictive validity (i.e., predicted anxiety and PTSD treatment outcomes, prospectively predicting increases in anxiety in non-clinical participants), and discriminant validity (discriminated between clinical and non-clinical subjects). The SBAF is comprised of 41 items with five clinical scales: vigilance, generalized anxiety, social anxiety, panic, and health anxiety. In one of the few studies investigating safety behaviors in PTSD treatment, Goodson and Haefel (2018) found that SBAF scores were significantly associated with outcomes in military veterans who underwent prolonged exposure therapy, such that reductions in total scores (as well as preventative and restorative scales created for the study), were significantly correlated with reductions in PTSD symptoms (PCL-5 scores).

Despite these promising results, several factors limit the utility of the SBAF in treating PTSD. First, it includes safety behaviors common to both PTSD and anxiety more broadly, and as such, many of the items may not be relevant to PTSD (Blakey et al., 2020). Second, as a 41-item measure, it does not lend itself to regular use throughout treatment to measure progress (or lack thereof) in reducing safety behaviors. To improve upon the SBAF for use in PTSD treatment (and research), we created a brief PTSD-specific scale (derived from items already found in the original measure) that could be used to assess PTSD-related safety behaviors and measure them throughout treatment.

An additional potential benefit of this subscale measure (and its use in PTSD treatment) is that several of the items are specific to vigilance, which has been found to be resistant to change in evidence-based treatments for PTSD (Cox et al., 2021). Bringing the principles of measurement-based care to vigilance may result in larger corresponding reductions in PTSD symptoms.

To examine the psychometric properties, factor structure, and clinical utility of the SBAF-PTSD, three studies were carried out. The first study describes the creation of the SBAF-PTSD and investigated its factor structure and psychometric properties. The second study investigated the clinical utility of the SBAF-PTSD in a PTSD effectiveness study. The third study sought to replicate our findings in two non-clinical samples.

## Overview and Purpose of Study One

The purpose of study one was to describe the creation of the SBAF-PTSD and examine its psychometric properties. Several hypotheses were derived based on existing clinical data using the SBAF-PTSD. First, we expected the SBAF-PTSD to demonstrate a latent structure consisting of one or two correlated dimensions. Additionally, we expected that the SBAF-PTSD would show adequate reliability as manifested by high inter-item coefficients and would be found to be relatively independent of the influence of demographic variables, including age, sex/gender, and ethnicity/race. Lastly, we expected that the SBAF-PTSD scores would be correlated with PTSD symptoms, to a greater extent, than with depressive symptoms, which would provide additional evidence for criterion validity of the scale.

## Study 1

## METHOD

### Safety Behavior Assessment Form– PTSD Scale Development

The preliminary SBAF-PTSD was comprised of items from the parent SBAF. Correlations between all 41 items on the SBAF and PCL total scores were calculated in two unpublished clinic data samples (gathered as part of standard routine care). The first clinic sample was 115 *treatment-seeking* veterans at the SLC VA PTSD Clinical Team, while the second sample was 63 veterans who completed Prolonged Exposure Therapy (PE) at the Philadelphia VA Medical Center. The analyses revealed 12 items significantly correlated with the PCL in both clinic data samples. These items included eight vigilance-related items and four additional items from the social anxiety and panic scales. Of the four other items, three came from the social anxiety subscale, and one came from the panic subscale. In the SLC VA PCT clinic sample, item correlations ranged from .21 to .42, with the total score (12 items) correlating at .53. In a sample of PE treatment completers from the Philadelphia VA Medical Center, pre-score items correlated with post-PCL scores with magnitudes ranging from .27 through .48, with the total score correlating at .37. Based on these findings, these 12 items were selected to comprise the SBAF-PTSD. Likewise, this SBAF-PTSD scale was used in the current series of validation studies. See Table 1 for an item listing of the SBAF-PTSD scale.

### Participants and Procedures

Participants were 173 treatment-seeking Veterans who presented for an assessment at a mid-sized, western VA PTSD clinic. Of the 173 participants, 4 did not complete the SBAF-PTSD and were excluded from the present analyses. Thus, the final sample consisted of 169 Veterans. The mean age of the participants was 42.81 ( $SD = 12.474$ ), and the majority were male ( $n = 145$ , 85.8%). Concerning race/ethnicity, 74% ( $n = 125$ ) were white, 5.3% ( $n = 9$ ) were black, 5.3% ( $n = 9$ ) were Hispanic, and 20.7% identified as another race. Nearly 60% of participants ( $n = 101$ , 59.8%) met criteria for PTSD, while others were diagnosed with other trauma/stressor disorders ( $n = 33$ , 19.5%) and non-trauma/stressor-related diagnoses ( $n = 30$ , 17.8%). Five participants (3.0%) were not assigned a DSM-5 diagnosis.

All participants completed an intake assessment, which included a diagnostic interview for PTSD, psychosocial history, and a battery of self-report measures. PTSD evaluations were carried out by licensed psychologists and their predoctoral psychology trainees. Study measures (and the remaining information from the intake packet) were collected by research assistants under the supervision of ER (7th author). Research assistants then entered the data from the intake packet into a secure electronic file, stored according to IRB specifications. The observed interrater reliability of the research assistants was 97.2%. The three measures for the current study (SBAF-PTSD Scale, PCL-5, and PHQ-9) were then abstracted into a de-identified file for subsequent statistical analyses. The current project and all study data and methods had full IRB approval from the University of Utah IRB.

### Measures

#### The PTSD Scale of the SBAF (SBAF-PTSD)

The SBAF-PTSD is a short measure of PTSD-related safety behaviors. As with the parent scale, respondents are asked to rate the frequency with which they engage in each safety behavior on a 4-point scale (0 = never; 3 = always), with scores ranging from 0 to 36 (higher scores are suggestive of more PTSD safety behavior usage). The SBAF-PTSD is brief and usually takes less than a minute to complete. Items include safety behaviors related to situational vigilance (e.g., “watch others for signs of danger”), checking (e.g., “check locks on doors or windows), threat-prevention strategies (e.g., “sit with back to wall”), and interpersonal escape/evasion strategies (e.g., “leave events early”, “cut conversations short”).

#### PTSD Checklist—5th Edition (PCL-5 Past Month)

The PCL-5 (Weathers et al., 2013) is a 20-item self-report measure assessing the severity of PTSD symptoms (Weathers et al., 2013). Respondents rate how much they were bothered by each of the 20 diagnostic symptoms of PTSD on a 5-point scale (0 = *not at all* ; 4 = *extremely* ) over the past month. Individual

items are summed to provide a total score ranging from 0-80. Total scores of 33 and above represent a positive screening for PTSD (Bovin et al., 2016; Weathers et al., 2013). The PCL-5 has demonstrated good psychometric properties, including strong internal consistency ( $\alpha = .91-.95$ ) in treatment-seeking military service members (Wortmann et al., 2016).

### Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 (Kroenke, Spitzer & Williams, 2001) is a 9-item self-report measure designed to assess symptoms of depression. Each item on this measure corresponds to a DSM-IV diagnostic criterion for a major depressive episode. Respondents rated the frequency with which they experience each of the symptoms of depression on a 4-point scale (0 = *not at all* ; 3 = *nearly every day* ). The PHQ-9 has well-established psychometric properties with diagnostic validity and high levels of sensitivity and specificity for major depression (Kroenke et al., 2001). Individual items were summed to provide a total score, with higher scores indicative of greater depression severity (*moderate* ; 15-19 = *moderately severe* ; 20-27 = *severe* ). Cronbach's alpha is typically greater than .85 in treatment-seeking veteran samples (e.g., Hershenberg et al., 2017)

### Data Analytic Procedures

Demographic characteristics, correlations, and ANOVAs were calculated using SPSS version 27.00 (SPSS, Chicago, IL). Correlations and ANOVAs were used to compare relationships and mean differences between measures to assess for convergent and divergent validity of the SBAF-PTSD with other constructs. Before conducting statistical analyses, data quality was confirmed, and there was no evidence that data were not-missing at random (NMAR); consequently, variable means were imputed for NMAR values. Additionally, assumptions of each statistical test to be run were checked. Critical outliers were not observed, and statistical assumptions were confirmed. However, there was evidence of non-normal multivariate distribution (e.g., significant Mardia coefficient of 24.65 for the SBAF-PTSD).

The factor structure of the SBAF-PTSD was examined using confirmatory factor analysis (CFA) via structural equation modeling with Analysis of Moment Structures (AMOS) software. Maximum likelihood estimation was used to produce all parameter estimates (e.g., factor loadings, correlations, errors). Bootstrap analysis was also used to assess the stability/robustness of model parameters, particularly because the item data were found to be non-normal. In all cases, 1000 bootstrap samples were used. Modification indices (MIs) were examined to evaluate the potential improvement in fit for the proposed models. Model fit for the CFAs was initially evaluated by examining the significance of all estimated parameters (regression weights, scale, error variances, and scale correlations). The overall goodness-of-fit was then evaluated with multiple fit indexes, and 90% confidence interval (CI) was used to evaluate the fit. A well-fitting model was defined as minimum non-significant chi-square ( $\chi^2$ ), normed chi-square ( $\chi^2/\delta\phi$ ) < 3.00, RMSEA < .08, GFI, AGFI, TLI, and CFI > .90 (for an adequate fit), and non-significant chi-square ( $\chi^2$ ), normed chi-square ( $\chi^2/\delta\phi$ ) < 2.00, RMSEA < .06, and various indices > .95 (for a good fit; e.g., Byrne, 2001; Hu & Bentler, 1999; Kahn, 2006; Kline, 2005; Thompson, 2000).

## Results

### Descriptive Statistics and Reliabilities

Means and standard deviations for the SBAF-PTSD items are reported in Table 2. Given the characteristics of the sample, these values seem to reflect higher base rates for pathology in clinical populations. Means, standard deviations, score ranges, and reliability coefficients for all test scales are reported in Table 3. As can be seen in the table, all test scales produced satisfactory reliabilities.

### CFA of the SBAF-PTSD

*CFA of the SBAF-PTSD* . Several confirmatory maximum likelihood analyses of the SBAF-PTSD items were completed to evaluate the latent structure of the SBAF-PTSD based on prior theoretical considerations (see Table 1). Specifically, rationally derived models were specified and evaluated for goodness of fit: 1) a one-factor model with all 12 items serving as observed reflective indicators of a unitary latent SBAF-PTSD

construct; 2) a correlated two-factor model wherein all items except item 3 were assigned to factors based upon prior factor assignment as either “Vigilance” or “Social”; 3) a hierarchical model wherein all items save item 3 were assigned to the two first-order factors of “Vigilance” and “Social” as in previous model and then these factors were specified as reflective latent indicators of a unitary higher order SBAF-PTSD construct; and 4) a one-factor model with item 3 removed given no prior assignment of this item on the “Vigilance” vs. “Social” dimension. In general, none of the rationally derived models fit the data well, and all the above models should be seen as inadequate.

Examination of the output for the original one-factor model with all 12 items revealed high modification indices (MI) for covariances that could be used to re-specify the model. In particular, if the errors for items 9, 10, and 11 are permitted to correlate, then overall model fit should improve. It also appeared that item 12 shared error variance with several items, including items 1, 5, 7, and 11. This is suggestive of a secondary construct. The MIs for regression weights, conversely, suggested that items 9, 10, and 11 seem to be predictive of item 3. In general, items 3 and 12 seem to introduce undesired noise in the theoretical models tested above.

Based on the above, several additional CFAs of the SBAF-PTSD items were completed to evaluate the latent structure of the instrument based on rational and empirical considerations. Specifically, three models were evaluated for goodness of fit: 1) a one-factor model with all items and correlated errors for items 9, 10, and 11; 2) a one-factor model with correlated errors for items 9, 10, and 11 and item 3 excluded; and 3) a one-factor model with correlated errors as described above except for items 3 and 12.

All model parameters are statistically significant ( $p < .001$ ) for all respecified models. However, closer examination of model fit indices provides mixed support for the first two models. For both, the normed chi-square is less than 2.0, the chi-square is significant, and GFI, CFI, and TLI are all above .90 but not above .95, indicating adequate fit. RMSEA is less than .08 but upper limit of confidence interval is above .08 (.07; 90% CI: .05-.09 and .07; 90% CI: .04-.09, respectively), which is problematic. In contrast, all model fit indices reflect excellent fit for model 3. Chi-square statistic is not significant ( $\chi^2_{(32)} = 43.06, p = .09$ ), normed chi-square is below 2.0 ( $\chi^2/\delta\phi = 1.35$ ) and GFI (.95), TLI (.97), and CFI (.979) are above .95, indicating excellent fit. RMSEA is below .08, including its confidence interval (.045; 90% CI: .00-.078).

While a one-factor model with correlated errors based on 10 items fits the data very well, including the correlated errors does not help guide how to best score and interpret the test. As well, given the suggestion of a presence of a secondary construct underlying the SBAF-PTSD, two bi-factor models were evaluated in the final step.

First, 10 items (items 3 and 12 excluded) were assigned to a unitary factor and to secondary latent trait groupings that reflect secondary constructs. Items 1, 2, 4, 5, 6, 7, and 8 were assigned to the first secondary latent construct, and items 9, 10, and 11 were assigned to the second secondary latent construct. The solution produced a negative variance estimate, and the loadings for items 1, 2, 4, 5, 6, 7, and 8 were all non-significant. Thus, the bi-factor model with two secondary constructs does not fit the data at all.

Last, the same 10 items were assigned to a unitary factor, with items 9, 10, and 11 also assigned to a secondary latent factor (see Figure 1). All model parameters are statistically significant ( $p < .001$ ) and all model fit indices reflect excellent fit. In fact, the model fit indices are exactly the same as they were for the one-factor model with correlated errors excluding items 3 and 12. In essence, the bi-factor model is equivalent to the model with correlated errors. One benefit of this model over the model with correlated errors, however, is that it justifies including all 10 items in the computation of a total SBAF-PTSD score while also using items 9, 10, and 11 to compute a secondary score. Based on prior theoretical considerations (see Table 2), this score was labeled the SBAF-PTSD Social Index, as all three items appear to tap into safety behaviors used to escape and evade social situations.

### Relationship of the SBAF-PTSD Scale (10-item version) with Demographic Variables

Product-moment correlation coefficients and the  $\chi^2$  statistic between the SBAF-PTSD Scale and age, gender

(coded as males vs. females), and ethnicity/race (coded as Caucasians vs. others) were calculated to assess the influence of the demographic variables on the SBAF-PTSD scores. No association was found between the SBAF-PTSD Scale and age ( $r = -.03, p = .661$ ), gender ( $\chi^2_{(28)} = 34.23, p = 0.193$ ), or race/ethnicity ( $\chi^2_{(26)} = 35.10, p = 0.11$ ). Additionally, one-way ANOVAs with planned contrasts were computed to compare average SBAF-PTSD total scores between diagnostic categories (i.e., PTSD, other trauma/stressor-related disorder, non-trauma/stressor-related disorder). Due to violation of the homoscedasticity assumption, coefficients without equal variances assumed are presented. Consistent with expectations, participants with PTSD and other trauma/stressor-related disorders reported similar SBAF-PTSD scores ( $M = 26.49, SD = 5.80$  and  $M = 24.47, SD = 7.65$ , respectively;  $t = 2.02, p = .17$ ) that were significantly higher than those with a non-trauma/stressor-related disorder diagnosis ( $M = 22.65, SD = 8.10; t = 3.85, p = .018$ ). While preliminary, total scores of 19 and greater may differentiate individuals with trauma and stressor-related disorders from those with non-trauma and stressor-related disorders.

### Correlations between the SBAF-PTSD and the PHQ-9 and the PCL-5 scales

Product-moment correlation coefficients between the SBAF-PTSD items and scales and the PHQ-9 and the PCL-5 scales can be found in Table 3. For scale-level analyses, examination of zero-order correlations indicates that the SBAF-PTSD Total scale demonstrates strong relationships with the PCL Total scale and Intrusions and Arousal scales, and moderate associations with the PHQ and Avoidance and Cognitions & Mood scales. Conversely, the SBAF-PTSD Social Index shows strong relationships with both the PHQ and the PCL Total scale and the opposite pattern of relationships with the remaining PCL scales (i.e., strong in magnitude relationships with Cognition & Mood and Arousal scales and moderate associations with Intrusions and Avoidance scales). Closer inspection of zero-order correlations between the SBAF-PTSD items and scales reveals that all items produce moderate associations with at least two of the scales and show statistically significant correlations with the remaining scales with two exceptions. Items 2 and 8 produced non-significant correlations with PHQ and Cognitions & Mood scale. Conversely, items 9, 10, and 11, which comprise the SBAF-PTSD Social Index, produced moderate to strong relationships with all the scales. This suggests that items 9, 10, and 11 each are a strong indicator of safety behaviors in general and should be retained as part of the revised SBAF-PTSD scale.

### Multiple Regression Analyses

Two sets of standard multiple regression analyses were completed with the PHQ-9 and the PCL-5 scales serving as predictors of the SBAF-PTSD Scale and Social Index (see Table 5). In the first set, the PHQ and the PCL Total scores were used as predictors. Both analyses were found to be significant ( $F_{(2, 163)} = 46.47, p < .001$  for the SBAF-PTSD Scale and  $F_{(2, 163)} = 48.50, p < .001$  for the Social Index). Examination of the squared semi-partial correlations indicates that only the PCL-5 score was a significant predictor of the SBAF-PTSD Scale. Conversely, the PHQ-9 and PCL-5 scores emerged as significant predictors of the SBAF-PTSD Social Index.

In the second set, the PCL Cluster scores were used as predictors of the SBAF-PTSD Scale and Social Index. Both analyses were found to be significant ( $F_{(4, 161)} = 29.74, p < .001$  for the SBAF-PTSD Scale and  $F_{(4, 161)} = 23.81, p < .001$  for the Social Index). Examination of the squared semi-partial correlations indicate that only Intrusion and Arousal scores were found to be significant predictors of the SBAF-PTSD Scale. Conversely, Cognitions & Mood and Arousal scores were significant predictors of the SBAF-PTSD Social Index.

In summary, multiple regression analyses support and clarify the findings from correlational analyses. The PCL-5 scores, particularly Intrusion and Arousal scales, appear most related to the scores on the SBAF-PTSD, which offers support for the criterion validity of the SBAF-PTSD Scale. The scores on the SBAF-PTSD Social Index in turn, were found to be related to the scores on both the PHQ and the PCL scores, and in particular, to the scores on Arousal and Cognitions & Mood scales of the PCL suggesting that the Social Index may tap into a non-specific anxious/depressive symptomology.

### Discussion

To examine the factor structure of the newly created SBAF-PTSD, we completed several confirmatory factor analyses (CFA) via structural equation modeling. This resulted in identifying the 10-item bi-factor model that reflects a unitary safety behaviors trait and a secondary latent construct labeled Social Index.

The revised 10-item scale of PTSD-related safety behaviors showed very good internal consistency (.84 and .80) for the SBAF-PTSD Total scale and the SBAF-PTSD Social Index, respectively) and was found to be unrelated to various demographic variables, including age, gender/sex, and ethnicity/race. Furthermore, results from correlational and multiple regression analyses demonstrated that the revised scale produces associations with the PCL and the PHQ consistent with theoretical expectations. Specifically, we found that the revised scale was more strongly related to PTSD than to depressive symptoms. Moreover, only intrusions and arousal (and not avoidance or cognitive and mood alterations) were found to predict safety behaviors for our sample. Taken together, our results support the criterion validity of the SBAF-PTSD as a measure of safety behaviors most directly related to two core features of PTSD: intrusions and arousal.

An interesting and unanticipated finding from our investigation is that the SBAF-PTSD scale includes a secondary trait, which is made up of three items that were originally developed to assess for safety behaviors used to escape and evade anxiety in social situations and which was therefore labeled the SBAF-PTSD Social Index. In contrast to the SBAF-PTSD scale, the scores on the Social Index relate most directly to scores on various indices of alterations of mood and cognition and behavioral avoidance. The Social Index thus appears to provide clinically useful information about the presence of co-occurring depressive symptoms.

Finally, the brevity of the SBAF-PTSD Scale is ideal for MBC during PTSD treatment, as patient burden is minimal. In addition, the SBAF-PTSD scale could be of value in PTSD outcome research investigating the relationships between changes in safety behaviors and PTSD symptoms and their relationship with improvements (or lack-there-of) in PTSD and depression.

## Study 2

### METHOD

#### Overview

To investigate the clinical utility of the newly refined 10-item SBAF-PTSD scale, we conducted an effectiveness study. The study was carried out on a PTSD Clinical Team with a sample of 47 treatment completers. All treatment was delivered according to standard care on the PCT Team. This study had two primary aims. First, to investigate the predictive ability of the SBAF-PTSD in PTSD treatment (as well as the impact of PTSD-related safety behaviors on treatment outcome). Second, to assess the effect of using the PTSD scale on hypervigilance, given that this symptom has been shown to be resistant in evidence-based practices (EBPs) for PTSD (Cox et al., 2021).

#### Procedures and Participants

The study sample was comprised of 47 veterans who completed Prolonged Exposure Therapy (PE) or Behavior Therapy for Anxiety and PTSD (BTAP) (also known as Safety Behavior Elimination Therapy for PTSD). All cases were completed through a PTSD Clinical team. As part of clinic procedures, participants attended a one-session “Start Point” group followed by an individual treatment planning session. In the individual treatment planning session, the treatments offered through the PCT were explained, and participants select their desired treatment. Participants in the current study either selected PE or BTAP. Twenty participants completed PE, and 25 completed BTAP. Participants were administered the SBAF-PTSD scale along with several other measures at pre- and post-treatment, as well as the SBAF-PTSD scale and PCL-5 throughout treatment (every 1-3 sessions).

All participants were male, with the exception of 1 female, and the mean age was 48.0 years ( $SD = 14.5$ ). Combat was the most common index trauma ( $n = 26$ ; 67%), followed by aftermath exposure ( $n = 7$ ; 18%), “other” ( $n = 5$ ; 13%), and sexual trauma ( $n = 1$ ; 2.6%). All participants were diagnosed with PTSD. Twelve carried comorbid diagnoses of depression (40%) and 11 had a comorbid anxiety disorder (23%).

## Therapists

All cases were treated ( $n = 26$ ) or supervised ( $n = 20$ ) by the first author (JTG). Supervised cases were completed by 11 therapists-in-training, including 2 postdoctoral fellows, 5 pre-doctoral interns, and 5 pre-doctoral practicum students. The breakdown of cases completed by therapists-in-training were as follows: 4 cases were completed by postdoctoral fellows, 12 cases were completed by pre-doctoral interns, and five were completed by pre-doctoral practicum students. All therapists-in-training attended a 3-day PE training and a 1-day BTAP training provided by the first author. In addition, all cases were discussed in weekly supervision.

## Treatments

### Prolonged Exposure Therapy (PE)

PE is a behavioral-based treatment designed to address symptoms trauma-related avoidance and intrusions. The primary interventions include 1) psychoeducation; 2) breathing retraining; 3) *in vivo* exposure, and 4) imaginal exposure. *In vivo* exposure typically begins in session two and is largely carried out through homework assignments. Imaginal exposure typically begins in session three and continues through the final session. For a more thorough description of PE, see Goodson et al. (2013).

### Behavioral Therapy for Anxiety and PTSD (BTAP)

BTAP is a treatment primarily focusing on eliminating and countering safety behaviors in PTSD. Treatment begins with education about safety behaviors and their role in maintaining anxiety and PTSD. Following, a master list of safety behaviors for each patient is created and addressed throughout treatment. BTAP has two primary phases and one optional phase. The first phase focuses on trauma processing and countering suppression-related safety behaviors. The second phase focuses on countering vigilance and other trauma/anxiety-related safety behaviors. The optional phase includes three modules: 1) Addressing trust-related safety behaviors; 2) Countering withdrawal and avoidance safety behaviors; and 3) Addressing rumination. For a more detailed explanation of BTAP, see Goodson and Haefel (2022).

## Measures

### The PTSD Scale of the SBAF (SBAF-PTSD)

The SBAF-PTSD is a 10-item short measure of PTSD-related safety behaviors. As noted above, scores on the PTSD-SBAF scale range from 0-30. The SBAF-PTSD also includes a 3-item social index related to escape/evasion strategies in interpersonal situations.

### PTSD Checklist—5th Edition (PCL-5 Past Month)

Please refer to Study 1 for a description of this measure.

### Data Analytic Procedures

The analytic strategy is sequential in nature, involving a hierarchical multiple regression approach conducted in R (Version 4.2.3). We first established a linear regression model with age, baseline SBAF-PTSD, and baseline PCL-5 (i.e., pre-treatment) scores as covariates. We then added our primary variable of interest, the change in SBAF-PTSD from pre- to post-treatment ( $\Delta$  SBAF-PTSD), to the second regression model. The third regression model included the above predictors, as well as treatment condition (BTAP coded as 0; PE coded as 1) to assess for differences between therapies. Unstandardized regression coefficients, standard errors, p-values for each predictor variable, and multiple  $R^2$  are reported for each model. To assess the incremental contribution of our primary variable of interest and the relevance of treatment condition, we compared the models sequentially using an Analysis of Variance (ANOVA) approach, which enabled us to examine whether the inclusion of  $\Delta$  SBAF-PTSD or treatment condition significantly improved model fit.

## Results

### Descriptive Statistics

Table 6 provides participant characteristics, pre-scores, post-scores, and difference scores for study measures. The mean pre-treatment score on the SBAF-PTSD was 24.63 ( $SD = 6.26$ , Range: 13-36), and for the PCL-5, the mean pre-treatment score was 49.04 ( $SD = 11.39$ , Range: 29-73). Participants in BTAP received an average of 10.5 ( $SD = 3.37$ ) sessions, closely matched by those in PE with an average of 10.45 ( $SD = 2.11$ ) sessions. Post-treatment, the mean SBAF-PTSD score reduced to 13.71 ( $SD = 7.12$ , Range: 2-27), and PCL-5 score decreased to 23.09 ( $SD = 12.63$ , Range: 2-53), resulting in an average decrease of 10.92 ( $SD = 6.28$ ) for SBAF-PTSD and 25.95 ( $SD = 11.81$ ) for PCL-5 scores.

## Regression Results

The first regression model included age ( $\beta = -0.04$ ,  $SE = 0.11$ ,  $p = .708$ ), baseline SBAF-PTSD ( $\beta = 0.42$ ,  $SE = 0.28$ ,  $p = .146$ ), and baseline PCL-5 ( $\beta = -0.51$ ,  $SE = 0.15$ ,  $p = .002$ ) as covariates. These predictors accounted for 22% of the variance in  $\Delta$  PCL-5,  $p = .016$ . In the second model, the primary variable of interest, change in SBAF-PTSD ( $\Delta$  SBAF-PTSD) from pre- to post-treatment was added. Inclusion of  $\Delta$  SBAF-PTSD ( $\beta = 1.16$ ,  $SE = 0.25$ ,  $p < .001$ ) significantly improved its explanatory power,  $p < .001$ , accounting for an additional 29% of the variance in  $\Delta$  PCL-5. A third model was run that added treatment condition as an additional predictor. However, including treatment condition ( $\beta = 0.65$ ,  $SE = 2.92$ ,  $p = .825$ ) did not significantly improve model fit,  $p = .83$ , suggesting  $\Delta$  SBAF-PTSD was central to  $\Delta$  PCL-5 regardless of treatment condition.

## Discussion

Study two was carried out to test the clinical utility of the SBAF-PTSD. The results of this study are promising. In particular, the changes in the SBAF-PTD scale were predictive of PTSD outcomes in both treatment conditions. This suggests that using the SBAF-PTSD scale in PTSD treatments may significantly add to the outcome variance.

In addition, the SBAF-PTSD scale was used throughout treatment as part of measurement-based care. The resulting effect for both treatment groups was an approximate 10-point reduction on the scale, suggesting large reductions in vigilance-related behaviors. This is a promising finding, as vigilance has been shown resistant to change in past PTSD treatment studies.

Anecdotal evidence collected from study participants gathered at the final session of treatment support these findings, with participants sharing sentiments such as “*I can now sit anywhere without it bothering me*”, “*The world is dangerous, but it is okay to go to the grocery store without a gun*”, and “*I learned that while my vigilance can be positive, it is a negative if it overtakes me or stops me from doing things.*”

In summary, there appears to be significant clinical utility in having a brief measure of PTSD-safety behaviors which can bring to bear the effects of measurement based-care during treatment. Furthermore, the SBAF-PTSD was predictive of treatment gains and accounted for a significant amount of outcome variance. Taken together, study results support the utility of the SBAF-PTSD in PTSD treatment.

## Study 3

### METHOD

#### Overview:

Study three was carried out to test the generalizability of the SBAF-PTSD in two non-clinical samples. Sample one consisted of 142 unselected undergraduate students from Notre Dame University (ND-Sample). Sample two consisted of 150 undergraduate students with various levels of trauma exposure and PTSD symptoms from the University of Utah (UT-Sample). The secondary aims of this study were to investigate associations between the SBAF-PTSD scale and quality of life (ND-Sample) as well as the scale’s ability to differentiate between groups with and without trauma exposure and varying PTSD symptoms (i.e., minimal symptoms vs probable PTSD). Assessing associations between the SBAF-PTSD scale and quality of life served to investigate the SBAF-PTSD’s association with general functioning (as opposed to clinical symptoms). Investigating the SBAF-PTSD scale with a mixed trauma sample served to test the scale’s ability to

differentiate participants with higher levels of PTSD associatively. We hypothesized that the SBAF-PTSD scale would be associated with quality of life and participants with higher PTSD symptoms would have significantly higher SBAF-PTSD scores.

## Participants and Procedures

The ND-Sample included 142 unselected undergraduates from the volunteer pool at the University of Notre Dame. All participants were college students and representative of the homogeneous population of Notre Dame Students. Participants signed informed consent and were compensated with extra credit for participating in the study. Participants completed the SBAF-PTSD scale along with the Wellbeing and Life Functioning scales from the Behavioral Health Questionnaire. These two subscales have been used to measure quality of life in several previous studies (Goodson et al., 2013, Goodson et al., 2017; Goodson & Haefel, 2022).

The UT-Sample consisted of 150 undergraduate students who completed the SBAF-PTSD scale and the PC-PTSD-5 scale. Group placement was based on PC-PTSD-5 answers. On this measure, the first question asks about trauma exposure. Participants who answered “no” to this question were assigned to the no trauma exposure group ( $n = 77$ ). Participants who responded “yes” to the first question were assigned to one of two groups: Group 2 (trauma exposure with minimal PTSD symptoms) was comprised of individuals who endorsed *two or less* PTSD symptoms ( $n = 45$ ), and Group 3 (trauma-exposed with likely PTSD) was comprised of individuals who endorsed three *or more* PTSD symptoms ( $n = 24$ ).

## Measures

### PTSD Scale of the Safety Behavior Assessment Form

Please see study two for a description of this measure.

#### *Quality of Life: Wellbeing and Life Functioning*(ND-Sample)

Quality of life was measured using two subscales from the Behavioral Health Questionnaire–20 (BHQ-20; Kopta & Lowry, 2002), which assesses global mental health. Wellbeing and Life Functioning subscales were used to assess quality of life. The Wellbeing subscale consists of three items that assess distress, life satisfaction, and energy/motivation (Cronbach’s alpha.71; Kopta & Lowry, 2002). The Life Functioning subscale consists of four items assessing work/school, intimate relationships, social relationships, and overall life enjoyment (alpha .80). Each item on these two measures is rated on a 5-point scale (0 = terrible;4= very well), with higher scores indicative of higher levels of quality of life. Wellbeing scores range from 0-12, while Life Functioning scales range from 0-16.

#### **The Primary Care PTSD Screen For DSM-IV PC-PTSD-5 (PC-PTSD-5) (UT-Sample)**

The PC-PTSD-5 is a five-item screening measure designed for primary care settings (Prins et al. 2016). The first question assesses trauma exposure (yes or no), with 5 follow-up questions assessing PTSD symptoms (i.e., nightmares, intrusions, arousal, numbing/detachment, guilt/blame). All item responses are dichotomous (yes or no) with an estimated clinical cutoff of 3 (“yes” responses on the five symptom questions). The PC-PTSD-5 has shown good psychometric properties, including discriminate validity (differentiating PTSD from non-PTSD respondents), test-retest reliability of .83, and internal reliability of .83 (Prins et al., 2016, Woolston et al., 2023).

## Results

### ND-Sample

Analyses were carried out to investigate the psychometric properties of the SBAF-PTSD scale, along with associations with quality of life. Mean scores, standard deviations, and correlations between SBAF-PTSD and SBAF-PTSD-Social Index and Quality of Life Measures are presented in Table 7. The SBAF-PTSD and SBAF-PTSD-Social Index demonstrated significant negative correlations with the quality-of-life measures (ranging from .25-.38).

## Reliability

Reliability analysis revealed a Cronbach's alpha of .83, which suggests good to excellent internal consistency. The mean inter-item correlation was .32, suggesting that items are correlated but not repetitive.

## UT-Sample

The means and standard deviations for the three study groups are reported in Table 8. The mean SBAF-PTSD score for the entire sample was 11.5 (4.6), with the SBAF-PTSD Social Index mean being 3.0 (1.7). The PC-PTSD-5 mean score for groups 2 and 3 was 1.85 (1.76).

## Validity

To assess for differences on the PTSD-SBAF scale according to group status, ANOVAs were conducted. Results of the analyses found that the probable PTSD group had significantly higher SBAF-PTSD scores than no trauma ( $F_{(1)} = 5.3, p < .02$ ) and trauma-minimal symptoms ( $F_{(1)} = 5.1, p < .02$ ) groups. There were no significant differences between the no-trauma and trauma-minimal symptoms groups. The same pattern of results occurred when SBAF-PTSD-Social Index was used instead of the full scale.

## Reliability

Reliability analysis revealed a Cronbach's alpha of .73, which is suggestive of adequate internal consistency. The average Inter-item correlation for the SBAF-PTSD was .24, which is also acceptable (Watson & Clark, 1995).

## Discussion

Study three was carried out to further investigate the psychometric properties of the SBAF-PTSD scale and its generalizability to non-clinical samples. In both samples, the SBAF-PTSD scale showed good internal consistency and adequate inter-item correlations. This suggests that the scale performs well in non-clinical samples and adds to its generalizability.

Additionally, the SBAF-PTSD scale demonstrated significant negative correlations with quality-of-life measures, such that higher scores on the SBAF-PTSD scale were associated with lower quality-of-life scores. This further extends the potential utility and association with measures of general functioning. These findings support other findings that higher safety behavior use is associated with lower quality of life (Meyer et al., 2019).

In this study, we also found that the SBAF-PTSD accurately differentiated individuals with probable PTSD from those with no trauma exposure and trauma-exposure and minimal symptoms. This is another promising finding suggesting that the scale can help identify those with PTSD symptoms, which is one of the primary purposes of the measure. Taken together, findings from these samples support the usefulness of the SBAF in non-clinical samples, thus suggesting it can be used effectively in research settings.

## General Discussion

There exists a conspicuous lack of safety behavior measures specific to PTSD treatment and clinical research. Moreover, none exist with the brevity appropriate for measurement-based care usage. The current paper described the creation and validation of the PTSD scale of the Safety Behavior Assessment Form across three different studies. Study one described the creation of the scale and demonstrated the factor structure. Study two showed the clinical utility of the SBAF-PTSD in a PTSD effectiveness study. Study three added further support to the scale's psychometric properties in two non-clinical samples. In this study, the SBAF-PTSD scale negatively correlated with quality-of-life measures and differentiated probable PTSD from non-probably PTSD and no trauma groups.

The initial SBAF-PTSD scale was comprised of 12 items that correlated with PTSD symptoms (i.e., PCL scores). Confirmatory Factor Analysis revealed a 10-item measure, which was a unitary construct of PTSD-related safety behaviors and a social/interpersonal index. The pattern of associations suggested that the full

scale strongly correlated with total PTSD scores while the social index correlated with negative cognitions and mood and depression. This suggests that the SBAF-PTSD scale is useful in different aspects of PTSD symptomology.

The PTSD-Social Index may have additional clinical utility within the context of PTSD. Given the importance of social support and difficulty with social connections among individuals with PTSD, these items could prove valuable treatment targets. Especially in light of consistent findings that social-related safety behaviors result in negative judgments while reducing such safety behaviors results in more favorable perceptions (Piccarillo et al, 2015). As such, reducing these safety behaviors in PTSD may result in improved social functioning and enhanced social support.

The 10-item measure was then used in a PTSD effectiveness study and was found to predict PTSD outcomes. This is encouraging and provides evidence of predictive validity. Moreover, using the SBAF-PTSD scale in the effectiveness study resulted in significant reductions in vigilance behaviors. This is another meaningful finding, as vigilance has been shown to be resistant to PTSD treatments. Given our findings, the lack of change in this symptom in past studies may be due to a lack of attention and measurement specific to vigilance. Moreover, research has found that post-treatment safety behaviors usage predicts faster symptom recurrence (Bessedo-Baum et al. 2012). Thus, reducing vigilance as much as possible may be important in the long-term maintenance of PTSD treatment gains. Taken together, The SBAF-PTSD scale may be highly useful in PTSD treatment (both in clinical and research settings).

The PTSD scale also lends itself to use with treatments that emphasize addressing safety behaviors in PTSD. Safety behaviors have been shown to contribute to, and maintain, PTSD symptoms. While findings remain preliminary, evidence exists that safety behavior elimination treatments can effectively reduce PTSD symptoms (Goodson & Haefel, 2022). While not controlled, the current study showed equivalent reductions in PTSD symptoms and safety behavior usage with BTAP and PE. Safety behavior treatments such as BTAP (as well as other PTSD treatments that address the ongoing sense of threat characteristic of PTSD), lend themselves to safety behavior measurement (both for evaluation and measurement-based care).

The current studies also supported the generalization of the SBAF-PTSD to non-clinical populations. These findings broaden the utility of the SBAF-PTSD scale, supporting its use in further research investigating safety behaviors and PTSD symptoms in non-clinical and subclinical samples. Moreover, the current studies were consistent with the notion that safety behaviors exert deleterious effects across a wide-range of outcomes. Specifically, we found that the SBAF-PTSD scale correlated with measures of wellbeing and life functioning (quality of life). This is consistent with past research studies (Meyer et al., 2019).

Additionally, the SBAF-PTSD scale accurately differentiated probable PTSD from no trauma and trauma and minimal symptoms. Thus, it demonstrated specificity in identifying individuals with PTSD symptoms, not just those with trauma exposure. This is an important finding given that the majority of individuals with trauma exposure do not develop PTSD.

### Summary and Future Directions

Several studies were conducted to investigate the psychometric properties of the SBAF-PTSD. Based on our findings, two items were removed from the scale, resulting in a brief 10-item measure of PTSD-related safety behavior usage. While preliminary, results from study one suggested that total scores of 19 and greater may differentiate individuals with trauma and stressor-related disorders from those with non-trauma and stressor-related disorders. This finding should be replicated in additional clinical studies using the SBAF-PTSD scale. Further, it would be beneficial to identify specific safety behaviors that are particularly important to address in PTSD treatment. Finally, as this is the first study to investigate the SBAF-PTSD, more clinical studies with larger populations will be helpful in further establishing generalizable norms.

### References

Beesdo-Baum, K., Jenjahn, E., Hofler, M., Lueken, U., Becker, E.S., & Hoyer, J. (2012).

Avoidance, safety behavior, and reassurance seeking in generalized anxiety disorder. *Depression and Anxiety*, 29, 948-957.

Bovin, M.J., Marx, B.P., Weathers, F.W., Gallagher, M.W., Rodriguez, P., Schnurr, P.P., &

Keane, T.M. (2015). Psychometric properties of the PTSD checklist for diagnostic and statistical manual of mental disorders-fifth edition (PCL-5) in veterans. *Psychological*

*Assessment*, 28, 1379-1391. doi: 10.1037/pas0000254.

Blakey, S.M, Kirby, A.C., McClure, K.E., Elbogen, E., B., Beckham, J.C., Watkins, L.L., &

Clapp, J.D. (2020). Posttraumatic safety behaviors: Characteristics and associations with symptom severity in two samples. *Traumatology*, pp. 26, 74-83.

Brown, T.A. & Tung, E.S (2018). The contribution of worry behaviors to the diagnosis of

generalized anxiety disorder. *Journal of Psychopathology and Behavior Assessment*, 40, 636-644. doi:10.1007/s10862-018-9683-5.

Brozovich, F. & Heimberg, R.G. (2008). An analysis of post-event processing in social anxiety disorder. *Clinical Psychological Review*, 28, 891-903

Clark, D. M. (1999). Anxiety disorders: Why they persist and how to treat them.

*Behaviour Research and Therapy*, 37, S5-S27. Clark, D. M., & Beck, A. T. (2010).

Clark, L.A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7 , 309-319.

Cox, K.S., Wiener, D., Rauch, S.A. . . . . Acierno, R (2021). Individual symptom reduction and

post-treatment severity: Varying levels of symptom amelioration in response to prolonged exposure for post-traumatic stress disorder. *Psychological Services*, December. . .

Deacon, B.J., Sy, J.T., Lickel, J.J., Nelson, E.A (2010). Does the judicious use of

safety behaviors improve the efficacy and acceptability of exposure therapy for claustrophobic fear? *Journal of Behavior Therapy and Experimental Psychiatry*, 41, 71-80.

Dunmore, E., Clark, D.M. & Ehlers, A. (1999). Cognitive factors involved in the onset

and maintenance of posttraumatic stress disorder (PTSD) after physical or sexual assault. *Behaviour Research and Therapy*, 37, 809-829.

Fennell M.J.V. (2005) Low Self-Esteem. In: Freeman A., Felgoise S.H., Nezu C.M., Nezu

A.M., Reinecke M.A. (eds) *Encyclopedia of Cognitive Behavior Therapy*. Springer, Boston, MA. [https://doi.org/10.1007/0-306-48581-8\\_66](https://doi.org/10.1007/0-306-48581-8_66)

Goodson J.T., Haeffel G.J. Treating Posttraumatic Stress Disorder in Combat Veterans: A

Guide to Using Behavior Therapy for Anxiety and PTSD (BTAP). *Clinical Psychology and Special Education*, 2022. Vol. 11, no. 2, pp. 63-80. DOI: 10.17759/cpse.2022110204

Goodson, J.T., Haeffel, G.J., Raush, D., & Hershenberg, R. (2016). The safety behavior

assessment form: Development and Validation. *Journal of Clinical Psychology*, 72, 1099-1111.

Goodson, J.T. & Haeffel, G.H. (2018). Preventative and restorative safety behaviors: Effects

- on exposure treatment outcomes and risk for future anxious symptoms. *Journal of Clinical Psychology*, *74*, 1657-1672
- Goodson, J.T., Helstrom, A.W., Moreno, & Smith (2017) . The impact of service-connected disability and therapist experience on outcome from prolonged exposure therapy with veterans. *Psychological Trauma: Theory, Research, Practice, and Policy*. *9*, 647-654.
- Goodson, J. T., Lefkowitz, C. M., Helstrom, A. W. and Gawrysiak, M. J. (2013), Outcomes of Prolonged Exposure Therapy for Veterans with Posttraumatic Stress Disorder. *Journal of Traumatic Stress*, *26*, 419–425.
- Kirk, A., Meyer, J.M., Whismna, M.A., Deacon, B.J., Arch, J.J (2019). Safety behaviors, experiential avoidance, and anxiety: A path analysis. *Journal of Anxiety Disorders*, *64*, 9-15.
- Helbig-Lang, S. & Petermann, F. (2010). Tolerate or eliminate: A systematic review of the effects of safety behaviors across anxiety disorders. *Clinical Psychology: Science and Practice*, *17*, 218-233.
- Helbig-Lang, S., Richter, J., Gerlach, A.L., Fehm, L., Strohle, A., Kircher, T., Deckert, J., Gloster, A.T., & Wittchen, H.U. (2014). The role of safety behaviors in exposure-based treatment for panic disorder and agoraphobia: Associations to symptom severity, treatment course, and outcome. *Journal of Anxiety Disorders*, *28*, 836-844.
- Hershenberg, R., Smith, R.V., Goodson, J.T., & Thase, M. E. (2017). Activating Veterans Toward Sources of Reward: A Pilot Report on Development, Feasibility, and Clinical Outcomes of a 12-Week . . . , Cognitive and Behavioral Practice (2017), <http://dx.doi.org/10.1016/j.cbpra.2017.04.001>.
- Hood, H., Antony, M.M., Koerner, N., & Monson, C.M (2010). Effects of safety behaviors on fear reduction during exposure. *Behaviour Research and Therapy* *48* , 1161 -1169.
- Joiner, T.E., Metalsky, G.I., Katz, J., Beach, S.R.H. (1999). Depression and excessive reassurance-seeking. *Psychological Inquiry*, *10*, 269-278.
- Kamphius, J.H. & Telch, M.J. (1998). Assessment of strategies to manage or avoid perceived threats among panic disorder patients: The texas safety maneuver scale (TSMS). *Clinical Psychology and Psychotherapy*, *5* 177-186
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*, 606–613.
- Meulders, A., Van Daele, T., Volders S., Vlaeyen, J.W.S. (2016). The use of safety-seeking behavior in exposure-based treatments for fear and anxiety: Benefit or burden? A meta-analytic review. *Clinical Psychology Review*, *45*-144-156.
- Milosevic, I., & Radomsky, A (2008). Safety behaviour does not necessarily interfere with exposure therapy. *Behaviour Research and Therapy* *46* , 1111–1118
- Meyer, K.A., Whisman, JM, Deacon, BJ, Arch, JJ. (2019). Safety behaviors, experiential avoidance, and anxiety: A path analysis approach. *Journal of Anxiety Disorders*, *64*, 9-15. doi: 10.1016/j.janxdis.2019.03.002.

- Olatunji, B.O., Etzel, E.N., Tomarken, A.J., Ciesielski, B.G., Deacon, B. (2011). The effects of safety behaviors on health anxiety: An experimental investigation. *Behavior Research and Therapy*, 719-728.
- Piccarillo, M.L., Dryman, M.T., & Heimberg, R.G. (2015). Safety behaviors in Adults with social anxiety: Review and future directions. *Behavior therapy*, 47, 675-687
- Plasencia, M.L., Alden, L.E., & Taylor, C.T. (2011). Differential effects of safety behaviour subtypes in social anxiety disorder. *Behaviour Research and Therapy*, 49, 665-675.
- Prins A, Bovin MJ, Smolenski DJ, Marx BP, Kimerling R, Jenkins-Guarnieri MA, Kaloupek DG, Schnurr PP, Kaiser AP, Leyva YE, Tiet QQ (2016). The primary care PTSD screen for DSM-5 (PC-PTSD-5): Development and evaluation within a veteran primary care sample. *Journal of General Internal Medicine*, 31, 1206-11. doi: 10.1007/s11606-016-3703-5.
- Riccardi, C.J., Korte, k.J., & Schmidt, N.B. (2017). False safety behavior elimination therapy: A randomized study of brief individual Transdiagnostic treatment for anxiety disorders. *Journal of Anxiety Disorders*, 46, 35-45.
- Salkovskis, P.M. (1991). The importance of behaviour in the maintenance of anxiety and panic: A cognitive account. *Behavioural Psychotherapy*, 19, 6-19.
- Salkovskis, P.M., Clark, D.M., Hackmann, A., Wells, A., & Gelder, M.G. (1999). An experimental investigation of the role of safety-seeking behaviours in the maintenance of panic disorder with agoraphobia. *Behaviour Research and Therapy*, 37, 559-574.
- Schmidt, N.B., Buckner, J.D., Pusser, A., Woolaway-Bickel, K., Preston, J., & Norr, A. (2012). Randomized controlled trial of false safety behavior elimination therapy: A unified cognitive behavioral treatment for anxiety psychopathology. *Behavior Therapy*, 43, 518-532.
- Wells, A., Clark, D.M., Salkovskis, P., Ludgate, J., Hackmann, A., Gelder M. (1995). Social phobia: The role of in-situation safety behaviors in maintaining anxiety and negative beliefs. *Behavior Therapy*, 26, 153-161.
- Woolston, C., Guitierrez, Chavez, Kaur, & Asnaani, A (2022). Impact of trauma exposure and posttraumatic stress symptoms on baseline self-reported safety behaviors during the trauma film paradigm. *Senior Honors Thesis: University of Utah*.
- Wortmann, J.H., Jordan, A.H., Weathers, F.W., Resick, P.A., Dondanville, K.A., Hall-Clark, B., Foa, E.B., Young-McCaughan, S., Yarvis, J.S., Hembree, E.A., Mintz, J., Peterson, A.L. & Litz, B.T. (2016). Psychometric analysis of the PTSD Checklist-5 (PCL-5) among treatment-seeking military service members. *Psychological Assessment*, 28, 1392-1403.
- Weathers, F.W., Litz, B.T., Keane, T.M., Palmieri, P.A., Marx, B.P., & Schnurr, P.P. (2013). The PTSD Checklist for *DSM-5* (PCL-5). Scale available from the National Center for PTSD at [www.ptsd.va.gov](http://www.ptsd.va.gov).

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