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A relative weights comparison of trauma-related shame and guilt as predictors of DSM-5 post-traumatic stress disorder symptom severity among US veterans and military members

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Objectives. Veterans and military service members have increased risk for post-traumatic stress disorder (PTSD) and consequent problems with health, psychosocial functioning, and quality of life. In this population and others, shame and guilt have emerged as contributors to PTSD, but there is a considerable need for research that precisely demonstrates how shame and guilt are associated with PTSD. This study examined whether a) trauma-related shame predicts PTSD severity beyond the effects of trauma-related guilt and b) shame accounts for a greater proportion of variance in PTSD symptoms than guilt.

Design. We collected cross-sectional self-report data on measures of PTSD symptom severity based on *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*) criteria, trauma-related shame, and trauma-related guilt via online survey.

Method. Participants included 61 US veterans and active duty service members. Hierarchical multiple regression and relative weights analysis were used to test hypotheses.

Results. In step 1 of regression analysis, guilt was significantly associated with PTSD. However, when shame was added to the model, the effect of guilt became non-significant, and only shame significant predicted PTSD. Results from relative weights analysis indicated that both shame and guilt predicted PTSD, jointly accounting for 46% of the variance in PTSD. Compared to guilt, trauma-related shame accounted for significantly more explained variance in PTSD.

Conclusions. This study provided evidence that among US veterans and service members, trauma-related shame and guilt differ in their association with PTSD and that trauma-related shame, in particular, is associated with the severity of PTSD.

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Practitioner points

Positive clinical implications

- Trauma-related shame and guilt explained almost half of the observed variance in PTSD symptom severity among this sample of US military veterans and service members.
- Trauma-related shame and guilt each made a unique contribution to PTSD severity after accounting for the similarity between these two emotions; however, shame was particularly associated with increased PTSD severity.
- These results highlight the importance of assessing and addressing trauma-related shame and guilt in PTSD treatment among military populations. We suggest that emotion- and compassion-focused techniques may be particularly relevant for addressing trauma-related shame and guilt.

Limitations of the study

- Cross-sectional data does not allow for determination of causal relationships.
- Although sufficiently powered, the sample size is small.
- The present sample self-selected to participate in a study about stress and emotions.

The military conflicts in Iraq and Afghanistan have resulted in increased focus on the impact of war on military service members. Many returning service members and veterans have been diagnosed with post-traumatic stress disorder (PTSD; Milliken, Auchterlonie, & Hoge, 2007), which is associated with poorer physical health, unemployment, legal problems, relationship conflict, and reduced quality of life (Monson, Taft, & Fredman, 2009; Schnurr, Lunney, Bovin, & Marx, 2009; Zatzick *et al.*, 1997). The preponderance of empirical PTSD research emerged from the early fear-based model, but this unilateral focus has shifted and influenced the changes to PTSD criteria in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*; American Psychological Association [APA], 2013). Although research on guilt in relationship to PTSD has been slowly accumulating for the past 25 years, shame has more recently emerged as a potentially significant contributor to PTSD (Beck *et al.*, 2011; Leskela, Dieperink, & Thuras, 2002; Øktedalen, Hoffart, & Langkaas, 2015; Pineles, Street, & Koenen, 2006; Street & Arias, 2001). However, our empirical understanding of guilt and shame in relationship to PTSD has been confounded by inconsistencies in use of terms, definitions, and measurement of these related emotional constructs.

From an evolutionary theoretical perspective, emotions are complex neurobiological systems that function to automatically process relevant environmental cues and initiate a behavioural response to promote survival (Ekman & Cordaro, 2011; Izard, 2009, 2011; Tooby & Cosmides, 2008). Each emotion system evolved independently in response to recurring environmental and interpersonal situations in human evolutionary history (Ekman & Cordaro, 2011; Tooby & Cosmides, 2008). Thus, each system includes a complex set of activating cues, feelings, expressions, and behavioural responses (Ekman & Cordaro, 2011; Izard, 1977, 2009) that are strongly influenced by memory, cognition, and appraisal in adulthood (Ekman & Cordaro, 2011; Izard, 2007, 2009, 2011; Panksepp, 2003). The self-conscious emotions of shame and guilt evolved to promote survival within an interdependent social context by responding to social threats in a manner that will protect social status by initiating submissive behaviour (shame; Gilbert & McGuire, 1998) or will repair damaged social relationships by prompting prosocial reparatory behaviour (guilt; Baumeister, Stillwell, & Heatherton, 1994; Lewis, 1971).

Cognitive appraisal theory complements evolutionary theory in its explanation of shame and guilt. Specifically, the causal cognitive attributions that influence shame and guilt are defined by three dimensions: locus, globility, and stability (Abramson, Seligman, & Teasdale, 1978; Tangney & Dearing, 2002; Tracy & Robins, 2004). Locus refers to

whether the attributions assign an internal versus external cause for the offending action/event. Globility refers to the extent to which an individual believes the cause is broad or specific. Stability refers to the perceived changeability of the cause.

Shame and guilt are similar in locus because they both inherently result from internal attributions (Tracy & Robins, 2004); however, they differ on globility and stability (Lewis, 1997; Tracy & Robins, 2004). Attributions resulting in guilt are specific and unstable, meaning they are related to the specific offending behaviour (i.e., causing harm to others) and the outcomes are viewed as changeable (i.e., reparations can be made). Hence, guilt is associated with the idea of having done something wrong, for example, 'I didn't keep my friend safe in combat' or 'I killed civilians during the war'. In contrast, the attributions involved in shame are globally incorporated into one's self-concept and are viewed as permanent. These attributions translate into the internalized belief that oneself is intrinsically and irrevocably flawed, for example, 'I'm a failure' or 'I'm a monster'. From these attributional qualities comes the commonly referenced distinction between doing a bad thing (guilt) versus being a bad person (shame). Gilbert (2004) further refined our understanding of these distinctions by proposing that guilt results from a very specific type of social offence, that is, causing harm to others. Shame, on the other hand, can result from diverse social norm violations that lead to perceived or expected devaluation by others (i.e., threat to social status), and these violations are internalized as evidence of the self as intrinsically bad (Cook, 1987, 1996; Gilbert, 1998; Kaufman, 1989; Lewis, 1997).

Evidence suggests that shame and guilt also result in divergent behavioural outcomes. Guilt may result in more prosocial behaviour, because the underlying attributions are tied to a specific harmful behaviour (not one's identity). The behavioural response to guilt motivates an attempt to repair and strengthen social relationships by making amends (Baumeister *et al.*, 1994; Tangney, 1991). Shame initiates a behavioural response to socially withdraw. This isolation is intended to protect one's social status by hiding the offence, which is viewed as intrinsically part of oneself and unchangeable, and thereby avoiding criticism from members of one's social network (Lewis, 1971, 1997; Pineles *et al.*, 2006).

Although shame and guilt both have implications for post-traumatic outcomes, shame may be particularly relevant due to the global and stable nature of the attributions made. Lewis (2008) proposed that shame develops and influences post-traumatic mental health via attributions about the cause and/or meaning of the event, specifically when an individual makes and internalizes negative attributions about their perceived role in the event and what the event means about their identity. Overall, existing studies have supported a stronger relationship between PTSD and shame than between PTSD and guilt (Beck *et al.*, 2011; Leskela *et al.*, 2002; Øktedalen *et al.*, 2015; Pineles *et al.*, 2006; Street & Arias, 2001; Vásquez *et al.*, 2012). These studies have consistently supported a significant relationship between shame and PTSD symptom severity; however, results regarding guilt have been mixed. When examining shame and guilt separately in relationship to PTSD symptom severity, some studies have observed a relationship between guilt and PTSD (Beck *et al.*, 2011; Øktedalen *et al.*, 2015; Pineles *et al.*, 2006), whereas others have found no association between guilt and PTSD symptoms (Street & Arias, 2001; Pineles *et al.*, 2006). While shame and guilt have both been implicated in PTSD symptom severity separately, research simultaneously examining both has been lacking. The few existing studies have produced opposite results from those examining guilt alone: finding a negative correlation between guilt and PTSD (Leskela *et al.*, 2002; Vásquez, de Arellano, Reid-Quiñones, Bridges, & Rheingold, 2012).

These mixed results highlight the need for a more nuanced understanding of shame and guilt, including how they relate to each other and to post-traumatic outcomes.

Difficulty in differentiating shame and guilt, both in theory and in practice, has been a consistent concern in this area of research. While attribution-based differences between shame and guilt have garnered empirical support (e.g., Pineles *et al.*, 2006), ambiguity remains. Specifically, researchers have noted that the overlapping characteristics of shame and guilt may result in a statistical suppression effect that could account for the effects of guilt on PTSD disappearing or reversing when simultaneously examined with shame (Pineles *et al.*, 2006; Vásquez *et al.*, 2012). It has also been proposed that shame and guilt may be expressions of the same emotion (i.e., shame) that simply differ in characteristics such as focus and intensity (Cook, 1996; Nathanson, 1992).

The conceptual confusion between shame and guilt has been compounded by the development and use of multiple measures based on idiosyncratic definitions of each emotion (Blum, 2008). As might be expected, measures of shame and guilt are often correlated and do not always exhibit good convergent and/or discriminant validity. For example, one commonly used measure of shame- and guilt-proneness is the Test of Self-Conscious Affect (TOSCA; Tangney, Wagner, & Gramzow, 1989). The guilt subscale of the TOSCA has been shown to be related to reparatory behaviours following wrongdoing but not to the emotional experience of either guilt or shame (Giner-Sorolla, Piazza, & Espinosa, 2011). The TOSCA shame subscale, on the other hand, was shown to be associated with negative self-conscious emotional experience in general, including both shame and guilt (Giner-Sorolla *et al.*, 2011). Additionally, the use of measures of shame- and guilt-proneness has been criticized as being potentially problematic for use with traumatized populations, because it is possible that trauma-specific shame and guilt could have different effects on post-traumatic outcomes than would a general proneness to these emotions (Beck *et al.*, 2011; Gilbert, 1998; Øktedalen, Hagtvet, Hoffart, Longkaas, & Smucker, 2014). These ongoing challenges in the measurement of shame and guilt have clouded our understanding of these emotions.

The present study

The present study examined the comparative roles of trauma-related shame and guilt as predictors of DSM-5 PTSD symptom severity among a mixed military and veteran sample. Our aim was to elucidate the unique contributions of these two distinct but related emotions. As stated above, there is consistent theoretical and empirical support for shame as a predictor of PTSD, which contrasts with mixed empirical findings regarding guilt as a predictor. Thus, we hypothesized that when shame and guilt were examined together, shame would emerge as a significant predictor of DSM-5 PTSD symptom severity beyond the effects of guilt and that shame would account for a greater proportion of explained variance in PTSD symptoms in comparison with guilt. We expected that guilt would still be a unique predictor of explained variance in PTSD symptom severity.

Materials and methods

Participants

Participants were US military service members and veterans ($N = 61$) who participated in a larger study that included civilians. Participants included in the present analyses

endorsed current or prior military service and reported a *DSM-5* index trauma. All participants were 18 years or older.

Procedure

Recruitment was conducted via study flyers, word of mouth, online university subject pool, social media (e.g., Facebook and appropriate listservs), and in-person recruitment at local organizations and Reserve drill weekends. Data were collected online via Qualtrics, a secure online data collection system. Electronic informed consent was obtained from all participants. All data were anonymous. Participants were able to skip any question or discontinue at any time. All procedures were IRB-approved and in accordance with the ethical standards of the Helsinki declaration.

Measures

Demographics were measured by a questionnaire that included items about age, gender, race/ethnicity, level of education, veteran/military status, era of military service, and number of deployments.

Criterion A traumatic events were identified using the *Traumatic Life Events Questionnaire* (TLEQ; Kubany *et al.*, 2000), a 23-item self-report checklist of potentially traumatic life events that has demonstrated good psychometric properties. Respondents rate the frequency with which they have experienced each event during their lifetime on a 7-point Likert scale (*0 = never* to *6 = more than 5 times*). Consistent with DSM-5 Criterion A, the portion of each question that queried peritraumatic fear, helplessness, or horror was eliminated. The authors checked index events to ensure they met *DSM-5* Criterion A.

PTSD symptom severity was measured by the *Posttraumatic Stress Disorder Checklist for DSM-5* (PCL-5; Weathers *et al.*, 2013), a valid and reliable (Bovin *et al.*, 2015) 20-item self-report measure of *DSM-5* PTSD symptoms experienced over the previous 1-month period. Items on the PCL-5 were directly anchored to the personal index trauma identified by each participant on the TLEQ. The Qualtrics system automatically populated the identified index trauma into individual items in place of phrases such as 'the event' or 'what happened', so that participants were reminded that each item was to be scored directly with relationship to their identified event. Participants rated the degree to which they were bothered by each symptom on a 5-point Likert scale (0 = *not at all* to 4 = *extremely*). The sum of all items provided a total PTSD symptom severity score. The PCL-5 exhibited excellent internal consistency in the present sample. Cronbach's alpha was .96 in the present sample.

Trauma-related shame and guilt were measured in a manner similar to other studies (e.g., Øktedalen *et al.*, 2015) using select content valid items from existing measures. Multiple measures of trauma-related shame were administered in full using their established response metric, and all items were directly anchored to the index trauma identified on the TLEQ. Items were q-sorted based on theoretical definitions of shame, guilt, and self-blame. Retained items were summed within measures, and these sum scores were converted to *z*-scores. The *z*-scores were then summed to create a standardized composite score for each emotional predictor.

Shame was defined by items that focused on self-evaluation (e.g., 'As a result of [the trauma] I find myself less desirable') or beliefs about others' perceptions of one's self (e.g., 'Because of [the trauma], others find me less desirable'). We excluded items reflecting

behavioural guilt (e.g., 'I did something I should not have done'), cognitive self-blame (e.g., 'I am responsible for what happened' or 'I blame myself for what happened'), and ambiguous content (e.g., 'What happened causes me a lot of emotional distress'). The final trauma-related shame variable was composed of a total of 30 items extracted from the Trauma-Related Shame Inventory (TRSI, 19 items; Øktedalen *et al.*, 2014), Trauma Appraisal Questionnaire (TAQ, eight items; DePrince, Zurbriggen, Chu, & Smart, 2010), and Shame and Guilt After Trauma Scale (SGATS, three items; Aakvaag *et al.*, 2016). Internal consistency among selected shame items in the current sample was excellent ($\alpha = .96$).

Guilt was defined by items that focused on evaluation of behaviours/actions (e.g., 'I did something that I should not have done'), moral judgements about the behaviours (e.g., 'What I did was unforgiveable'), and behaviourally based causal attributions about the event (e.g., 'I must have done something really awful to make this happen'). We excluded items reflecting shame, self-blame, and ambiguous content (as defined above). The final trauma-related guilt variable was composed of 15 items extracted from the Trauma-Related Guilt Inventory (TRGI, nine items; Kubany *et al.*, 1996), Shame and Guilt After Trauma Scale (SGATS, three items; Aakvaag *et al.*, 2016), Trauma-Related Shame Inventory (TRSI, two items; Øktedalen *et al.*, 2014), and the Trauma Appraisal Questionnaire (TAQ, one item; DePrince *et al.*, 2010). Internal consistency for our measurement of guilt was excellent ($\alpha = .92$).

Data analyses

A priori power analysis using G*Power 3.1.9 (Faul, Erdfelder, Lang, & Buchner, 2007) required a minimum of 42 participants to detect an effect of .20 or greater with $\alpha = .05$ and $\beta = .80$ using two predictors in hierarchical regression analyses. The present sample size ($N = 61$) exceeded these requirements for sufficient power. We used hierarchical multiple regression to examine trauma-specific shame and guilt as predictors of PTSD symptom severity. Because it was hypothesized that shame would emerge as a stronger predictor beyond the effects of guilt, guilt was entered in the first step of the regression model and shame was entered in the second step. In step 2 of the regression model, the $F\Delta$ statistic and $R^2\Delta$ statistic were used to determine the extent to which shame was associated with PTSD symptom severity over and above the effects of guilt.

Given inherent issues of multicollinearity between guilt and shame, regression analysis was supplemented with relative weights analyses (Tonidandel & LeBreton, 2011) to elucidate the unique contributions of each emotional predictor. Relative weights analysis reduces error by transforming correlated predictors (i.e., shame and guilt) into orthogonal variables, completing regression analyses with the orthogonal predictors, then converting the resulting standardized regression weights back to the original variable metric (Johnson, 2000; Tonidandel & LeBreton, 2011). Relative weights analyses used 1,000 sample bootstrap 95% confidence intervals (CI) for the individual relative weights and for differences between weights of predictors. Significance tests are statistically significant when the corresponding *CI* does not span 0. The resulting relative weights statistics represent the amount of explained variance in PTSD symptom severity uniquely accounted for by each predictor.

Results

Sample characteristics

Sample demographic and military service characteristics are presented in Table 1. The sample was primarily married, heterosexual, Caucasian veterans. The majority of participants indicated an interpersonal event (including combat) as their index trauma (n = 43, 71.7%). The most commonly endorsed interpersonal traumas were non-combat-related interpersonal events (n = 25, 58%). Combat exposure was the second most common index trauma (n = 18, 41.8% of interpersonal traumas and 30% of all index events). All participants reported multiple unique (M = 7.79, SD = 3.45, range: 2–16) and repeated trauma exposures (M = 22.77, SD = 14.40, range: 4–65, including repetitions of same type). Univariate results and bivariate correlations are reported in Table 2.

Hypothesis testing

Results of linear regressions are presented in Table 3. In step 1, guilt alone was a significant predictor of PTSD symptom severity and explained 31.5% of the variability in PTSD symptoms. In step 2, shame added a unique contribution to PTSD symptoms beyond the effect of guilt, $F\Delta$ (2, 57) = 15.02, $p < .001$. Shame and guilt together explained 45.8% of the variance in PTSD symptom severity. Interestingly, the presence of shame subsumed the effect of guilt, which became statistically non-significant (p = .53) when shame was added in the second step.

Results from relative weights analysis are visually portrayed in Figure 1. Findings indicated that both shame and guilt were significant unique predictors of PTSD symptom severity, because neither *CI* spanned 0. Conjointly shame and guilt accounted for 45.8% of the variance in PTSD symptom severity (i.e., accounted-for or explained variance). Whereas guilt accounted for 34.8% of the explained variance, 95% CI [0.063, 0.268], shame accounted for 65.2% of the explained variance in total PTSD symptom severity, 95% CI [0.075, 0.472]. Comparison between the relative weights of shame and guilt showed that shame was a significantly stronger predictor than was guilt, 95% CI [0.01, 0.15].

Discussion

The aim of the present study was to augment our theoretical and clinical understanding of trauma-related shame and guilt by exploring their unique associations with *DSM-5* PTSD symptom severity among veterans and military service members. Shame and guilt were significantly associated with PTSD symptom severity, explaining 45.8% of the variance in total PTSD symptom severity. While guilt appeared to be associated with variance in PTSD symptoms severity, when shame was added to the regression model, guilt no longer contributed to PTSD symptoms. These findings are consistent with previous studies (Leskela *et al.*, 2002; Pineles *et al.*, 2006; Street & Arias, 2001); however, relative weights analysis revealed that both shame and guilt uniquely contributed to PTSD symptom severity. While shame was a significantly stronger predictor of PTSD symptom severity than was guilt, guilt was still a unique contributor. Overall, the present findings support both shame and guilt as important and distinct emotional factors in understanding and treating PTSD among veterans and military service members, while highlighting the relative importance of shame.

Table 1. Sample demographic characteristics ($N = 61$)

Variable	*n*	%
Gender[a]		
Male	49	83.1
Female	10	16.9
Age ($M = 40$; $SD = 12.26$, range: 21–67)		
20–29	11	18
30–39	11	18
40–49	11	18
50–59	8	13.1
60–69	2	3.4
Race		
White/Caucasian	41	67.2
Native American	7	11.5
Hispanic/Latino/a	5	8.2
Black/African American	3	4.9
Multiracial	3	4.9
Asian	2	3.3
Education level		
High school/GED	5	8.2
Some college	26	42.6
4-year degree	19	31.1
Postgraduate degree	11	18
Relationship status		
Partnered[b]	44	72.2
Single[c]	17	27.8
Military status		
Veteran	47	77
Reserves/Guard	10	16.4
Active duty	4	6.6
Branch[d]		
Marines	23	37
Army	18	29.5
Navy	14	23
Air force	7	11.5
Deployments ($M = 2.25$, $SD = 1.8$, range: 0–6)		
OIF/OEF/OND	37	60.7
Iraq	23	37.7
Afghanistan	18	29.5

Notes. [a]Two Ss declined to indicate gender.
[b]Partnered = married, cohabitating, or in a committed relationship.
[c]Single = never married and separated/divorced.
[d]one S indicated service in two branches.

With respect to shame in the context of PTSD, the present findings have potential clinical implications for case conceptualization and therapeutic strategies. This and other emerging research (e.g., Øktedalen *et al.*, 2015) supports the importance of shame in PTSD symptom severity, independent of the effects of guilt. Thus, clinical care may be improved by assessing and treating shame and guilt distinctly. Whereas guilt may be

Table 2. Univariate Statistics and correlations among predictors

			Pearson *r*	
	M (*SD*)	Range	PTSD	Guilt
Total PTSD	24.13 (20.31)	0 to 71	–	–
Guilt	−0.45 (2.43)	−2.76 to 7.61	.56	–
Shame	0.25 (2.93)	−2.53 to 8.50	.67	.78

Note. Reported PCL-5 range is true range of scores endorsed by study participants. Highest possible total score on the PCL-5 is 80.

Table 3. Hierarchical linear models of effects of trauma-related guilt and shame on PTSD symptom severity

	β	Omnibus *F* (1, 58)	Omnibus R^2	$F\Delta$ (2, 57)	$R^2\Delta$
Model 1					
Guilt	.56***	26.68***	0.315	–	–
Model 2					
Guilt	.10	24.08***	0.458	15.02***	0.143
Shame	.60***				

Notes. ***$p < .001$.

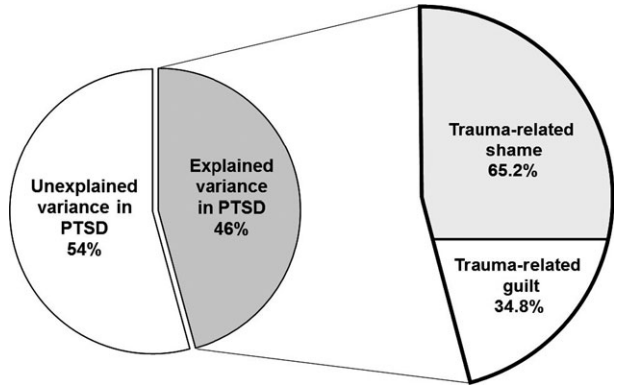

Figure 1. Unique variance in PTSD symptom severity accounted for by trauma-related shame and guilt.

conceptualized as resulting from cognitive distortions about trauma-related behaviours (e.g., thoughts about wrongdoing), shame, on the other hand, may be conceptually linked to stable core beliefs that are more resistant to change (e.g., beliefs about self-worthlessness). While guilt is often responsive to cognitive restructuring and restitution, amelioration of shame may require a unique, emotion-focused approach.

Although PTSD clinical interventions have traditionally focused on explicitly addressing post-traumatic guilt, many of these empirically supported psychotherapies also relevantly address shame. For example, cognitive processing therapy (CPT) is designed to identify and reduce a variety of manufactured emotions (i.e., emotional

responses to maladaptive trauma interpretations), including both guilt and shame (Resick, Monson, & Chard, 2016). However, in CPT patient materials for identifying emotions, guilt and shame are not depicted as separate emotions (Resick *et al.*, 2016). Similarly, prolonged exposure therapy (PE) can also accommodate and address shame; Smith and colleagues (2013) provide a comprehensive guide to addressing perpetration-related shame in PE. However, there is a dearth of clinical guidance on strategies to explicitly address shame in PE outside of perpetration (e.g., experiences of childhood sexual abuse).

Despite the fact that expert psychotherapists can assess and treat shame in the context of CPT and PE, neither of these interventions explicitly addresses shame in a specific and consistent way. Contrastingly, some PTSD and transdiagnostic treatments have a more explicit focus on shame. For example, narrative exposure therapy (NET), which was designed to treat PTSD among refugees and displaced persons, introduces the theoretical concept of a 'shame network' (Schauer, Schauer, Neuner, & Elbert, 2011). The shame network is conceptually linked to experiences of abuse and degradation and involves trauma cues, shame-proneness, self-criticism/self-blame, and the behavioural impulse to hide (emotionally or physically) (Schauer *et al.*, 2011). Once the therapist explicitly assesses the patient's shame network in NET sessions, the patient is assisted in reducing shame by exploring the context of the trauma and integrating it into a comprehensive life history narrative. Additionally, compassion-focused therapy (CFT) – while constituting a transdiagnostic rather than trauma-focused approach to treatment – also directly addresses shame in its theoretical underpinnings and practice (Gilbert, 2009). In CFT, the therapist both models compassion towards the patient and teaches compassion skills to the patient, thereby reducing shame and self-criticism (Gilbert, 2009). CFT has shown initial feasibility for PTSD treatment, and it may be potentially appropriate for stand-alone treatment of PTSD that specifically addresses shame (Au *et al.*, 2017).

The present study continued to highlight the conceptual struggle in our understanding of shame and guilt, because they are correlated yet still distinct. The unique contribution of guilt supported by the relative weights analysis suggested that the non-significant or negative association between guilt and PTSD in previous research may be the result of statistical suppression due to multicollinearity and measurement error. It also raised the theoretical possibility that shame may be the foundational emotion, of which guilt may be a less insidious variation.

The present methodology did present limitations. Although the sample size provided sufficient power, it was relatively small. A larger sample may reveal different effects between variables. The cross-sectional nature of the sample also limits inferences that can be made from the data. Causal relationships cannot be established without longitudinal design. Additionally, the present sample self-selected and did not include individuals who did not have access to the Internet. The use of retrospective self-report measures may also be influenced by memory and other biases (e.g., social desirability, level of self-awareness). The composite of shame used did not differentiate between internal and external shame; therefore, it remains unknown whether these types of shame may have differential effects on PTSD symptom severity.

Despite these limitations, the present study exhibited several important strengths. This is among the first studies to empirically examine both trauma-related shame and guilt in relationship to *DSM-5* PTSD. Furthermore, the measures of trauma-related emotions and PTSD symptoms were explicitly anchored to the same index trauma. A comprehensive and unique approach was used to calculate composite scores of shame and guilt, which helped to clarify and compare theoretically consistent measurements of these related emotions. Additionally, we used relative weights analysis to supplement

traditional regression analyses, which was an innovative way to examine these related emotional predictors. Relative weights results provided novel evidence that both guilt and shame produce a unique influence even when examined in combination.

Continued research is needed to explore effective ways of differentiating and measuring trauma-specific, self-conscious emotions. Comparison between trait-based and trauma-specific shame and guilt would also help elucidate the proposal that trauma-specific emotions may be unique and/or more intense than their general trait-based experience (Gilbert, 1998). Additionally, a better understanding of different types of shame (i.e., internal vs. external) is needed in relation to PTSD symptom severity and in comparison with guilt. Furthermore, longitudinal studies are needed to explore the potential impact of early and cumulative adverse events on the development of trait shame and guilt. Future research is also needed to further explore shame and guilt's relationship to specific types of traumatic events or event characteristics, such as victim–perpetrator relationship, betrayal, and moral injury. Shame and guilt have also been shown to be strongly associated with increased risk of suicidal ideation, above and beyond the presence of PTSD and depression (Bryan, Morrow, Etienne, & Ray-Sannerud, 2013). Gaining a better understanding of the role of shame and guilt in self-harm and suicide risk may provide valuable insight to help address these risk factors among veterans.

Conclusion

Among this sample of US military veterans and service members, trauma-related shame and guilt explained nearly half of the variance in *DSM-5* PTSD symptom severity. Although shame and guilt each uniquely contributed to PTSD severity, the strongest predictor was shame. The present findings provide additional evidence for the theoretical understanding of shame and guilt as distinct emotions with unique roles in psychopathology, specifically PTSD. Given shame's relative importance in explaining PTSD symptom severity, conceptualization and treatment may be improved by assessing and targeting trauma-related shame.

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