




Negative Attributions as a Source of Vulnerability for trauma-related Shame and PTSD Symptoms

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Abstract

Shame is a common trauma response that is associated with the development and maintenance of PTSD. Phenomenological descriptions of shame indicate that shame arises from internal, stable and global causal attributions (negative attributions) for the precipitating event. The current study investigated whether negative attributions would be associated with higher levels of shame and PTSD, and whether shame would mediate the relationship between causal attributions and PTSD. As negative attributions may reflect a common transdiagnostic process in both depression and PTSD, it also examined whether depression would moderate this relationship. Eighty-seven participants meeting criteria for a Criterion A stressor were administered a structured PTSD diagnostic interview and a series of self-report measures. Findings indicate that shame mediated the relationship between internal, stable and global trauma-related causal attributions and PTSD symptoms. Further, depression did not moderate this relationship, indicating that negative causal attributions are associated with shame and PTSD independent of depression. Results provide empirical support for the cognitive concomitants of trauma-related shame, which raise the possibility that addressing negative attributions through cognitive therapeutic methods may be pertinent in reducing trauma-related shame. Future prospective data is needed to establish cognitive antecedents to shame.

Keywords attributions · shame · depression · PTSD · posttraumatic stress disorder

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Introduction

Following trauma exposure, the experience of prolonged psychological sequelae can lead to the development of Posttraumatic Stress Disorder (PTSD). Characterised by unwanted intrusive memories, hyperarousal and a heightened sense of perceived threat (American Psychiatric Association [APA], 2013), PTSD is linked to range of psychiatric comorbidities and has a high burden of disease (Kessler, 2000). Historically, PTSD has been classified as a fear-based disorder. However, since the inclusion of alterations in cognition and mood as an additional DSM-5 PTSD symptom cluster, there has been growing interest in the role of shame as a key emotional trauma response (APA, 2013) which is significantly associated with a range of PTSD symptoms such as hyperarousal, intrusive recollections, and avoidance (Lopez-Castro et al., 2019). Moreover, experiences of shame immediately following trauma exposure is predictive of PTSD symptoms and future trauma-reactions up to six years post trauma exposure (Andrews et al., 2000; Feiring & Taska, 2005). There is also evidence suggesting that changes in shame may be predictive of reductions in PTSD symptoms among treatment resistant populations (Øktedalen et al., 2015), however further research is needed to bolster findings.

Shame and PTSD

Phenomenological descriptions of shame classify it as a self-conscious emotion, characterised by feelings of inadequacy and worthlessness, evoking perceived judgement from others (Gilbert et al., 1994; Lewis, 2003; Tangney & Dearing, 2002). Even in the absence of an external threat, the individual may still feel a sense of impending threat due to fear of rejection and stigmatisation but also an internal threat due to ongoing negative self-evaluation. Consequently, the feeling of shame is often painful, and promotes avoidance, which could impede trauma processing and recovery (Leonard et al., 2020; Tipsword et al., 2021). Thus, understanding the factors that may give rise to shame may present a potential target for therapeutic intervention.

Theoretical models of shame assert that shame is a cognitively derived complex emotion that arises through an appraisal process (Lewis, 1971, 2003; Tangney et al., 1992; Tracy & Robins, 2004). Specifically, it is elicited when an individual attributes the precipitating event to internal causes. Beyond the causal locus, shame is said to arise when the internal cause is attributed to both stable and global, such as one's character rather than situational specific and time-bound as it is with guilt (Lewis, 1971; Tangney & Dearing, 2002; Tracy & Robins, 2004). Internal attributions, place the responsibility on the individual as a causal contributor, whilst stable and global attributions refer to causal factors that are enduring and generalizable to all facets of one's life.

Attributions and Shame

Following exposure to a negative and aversive event, it stands to reason that individuals will be motivated to assign meaning and attribute cause for their experiences (Massad & Hulse, 2006). Thus, the role of negative attributions can also easily be applied to our understanding of PTSD (Joseph et al., 1993). The investigation of negative attributions in relation to shame and PTSD also makes sense from a cognitive theoretical perspective. The cognitive model of Ehlers & Clark (2000) proposes that individual variability in trauma-related appraisals are responsible for divergent emotional and behavioural responses that contribute to the development and maintenance of PTSD symptoms over time.

If causal attributions function as a cognitive antecedent to shame, it could be argued that shame is a potential pathway between negative attributions and PTSD symptoms.

In their conceptual model of shame and adjustment in child sexual abuse (CSA) survivors, Feiring et al., (1996) proposed that shame arises from sexual abuse through negative attributions which leads to shame and overall maladjustment. This model has been applied to other samples of CSA survivors indicating that shame may mediate the relationship between negative attributions and PTSD symptom severity (Alix et al., 2017; Feiring et al., 2002; Uji et al., 2007). Although promising, these studies utilised sexual abuse specific attributions and shame measures which limit their generalizability to other trauma exposed populations. Further, these studies did not explicitly assess the dimensions of internal, stable and global attributions which are arguably the necessary components of the attribution-emotion link in shame (Tracy & Robins, 2004).

Depression as a Potential Moderator

In the above section, we reasoned that negative causal attributions would be a cognitive antecedent to trauma-related shame, which may in turn lead to stronger associations with PTSD symptoms. However, this process may also be influenced by depression. The cognitive antecedents of shame draw parallels to attributional patterns described in the Hopelessness Model of Depression by Abramson et al. (1989). According to the model, individuals who tend to make internal, stable and global attributions for negative events are said to have a depressogenic attributional style. This engenders feelings of helplessness and hopelessness over one's situation, thereby increasing their vulnerability to depression (Abramson et al., 1999; Seligman et al., 1979). Although both shame and depression can be understood in attributional terms, they are considered distinct constructs. Feelings of shame entail a complex amalgamation of cognitive, affective and behavioural responses that are prompted by negative self-evaluation. As indicated, shame also involves the negative focus on oneself, and self-condemnation. To illustrate Tangney et al., (1992) found that shame proneness was positively correlated with making internal, stable and global attributions for negative events (e.g., negative attribution style found in depression). However, when shame-proneness was considered in the equation with negative attri-

butional style, it doubled the proportion of variance predicted by depression. Thus, negative attributions (internal, stable and global attributions) are a necessary component that precipitates a shame experience but is not sufficient.

Considering this, the current study assessed two models. Firstly, we aimed to investigate the relationship between negative attributions (internal, stable, and global attributions) shame and PTSD. It was hypothesised that negative attributions, shame, and PTSD symptoms will all be significantly associated. As negative attributions are purported to be key cognitive antecedents to shame, we sought to provide empirical linkage between negative attributions, shame and PTSD. Our second hypothesis was that the relationship between negative attributions and PTSD symptoms will be mediated by trauma-related shame (Seah & Berle, [in press](#)). We used a simple mediation model to examine this possibility.

Secondly, although shame and depression are considered as separate constructs, it may be reasonable to assume, from a clinical standpoint given their shared cognitive vulnerability, that higher levels of depression may also strengthen the relationship between trauma related shame and PTSD symptoms as indicated by the significant robust association between shame and depression (DeCou et al., 2021). As negative attributions are also an important cognitive component of depression, it is also possible that individuals who make internal, stable and global attributions for their traumatic experiences may experience more severe PTSD symptoms if they also exhibit higher levels of depression.

Third, several studies have found that internal, stable and global attributions for traumatic events are associated with higher levels of PTSD symptoms in range of trauma survivors (Frye & Stockton, 1982; Ginzburg et al., 2003; Joseph et al., 1991; McCormick et al., 1989; Williams et al., 2002; Zinzow & Jackson, 2009). However, a couple of limitations are worth noting. Firstly, empirical studies assessing negative trauma attributions have utilised measures of attributional style which have relied on hypothetical negative events to predict trauma-reactions. However, traumatic events are phenomenologically distinct from everyday negative encounters and appraisals tethered to traumatic events are more likely to explain greater variance in PTSD symptoms (Gray & Lombardo, 2004; Reiland et al., 2014). Secondly, not all the aforementioned studies controlled for depression, which poses an interpretative problem. Whilst there is some specificity of negative attributions to depression, it is likely that a negative attributional style is a common transdiagnostic factor in both depression and PTSD (Ehring et al., 2006; Gonzalo et al., 2012). Further, depression is often highly co-morbid with PTSD (Campbell et al., 2007; Flory & Yehuda, 2015; O'Donnell et al., 2004), with suggestions that PTSD and depressive symptoms have a shared vulnerability following trauma exposure, and become less differentiated particularly when symptoms of PTSD are chronic and persistent (Breslau et al., 2000). Thus, it is also possible that individuals who make internal, stable and global attributions for their traumatic experiences may experience more severe PTSD symptoms if they also exhibit higher levels of depression.

Considering this, we assessed the potential of a moderated mediation effect, which assumes that depression would influence the relationships between negative attributions, shame and PTSD. Specifically, we assessed if depression would moderate the relationship between the mediation model of shame and PTSD: the relationship

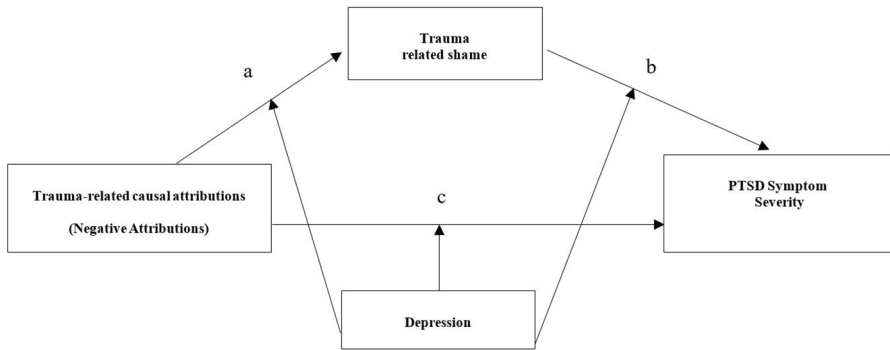


Fig. 1 Mediation Model

between negative attributions and shame, and the relationship between shame and PTSD. It was hypothesised that the mediation model of interest will vary significantly as a function of depression (Fig. 1).

Method

Participants and Procedure

Ethical Approval for the current study was obtained from a large university in Sydney, Australia. Participants were recruited online through social media and Prolific Academic (ProA), a crowdsourcing platform to participants currently residing within The United Kingdom and United States, Canada, Ireland, and New Zealand.

Only English-speaking participants over the age 18, who endorsed exposure to at least one DSM-5 PTSD Criterion A stressor in their lifetime were invited to participate in the study. Participants who consented to participate were administered The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Weathers, Blake, et al., 2013a) by the primary author, a trained psychologist to confirm exposure to a Criterion A stressor and current PTSD symptoms. Participants who met criteria for exposure to a Criterion A stressor were then administered a battery of self-report measures.

The CAPS-5 (Weathers et al., 2013a) is a 30-item structured interview measure of PTSD that assesses DSM-5 symptoms of PTSD on a frequency and intensity scale. A symptom cluster severity score is calculated by summing the individual severity scores for symptoms corresponding to each DSM-5 symptom cluster. The onset and duration of symptoms along with subjective distress and impact of symptoms on social and occupational functioning are also assessed. A total CAPS-5 severity score is calculated by summing each severity score for each of the 20 DSM-5 PTSD symptoms. For a diagnosis of PTSD, participants must endorse exposure to a Criterion A stressor and meet the symptom severity criteria for each symptom cluster (B-G) (APA, 2013). The CAPS-5 has demonstrated strong interrater reliability and test-retest reliability and good convergent validity with the PCL-5 (Weathers et al., 2018).

One-Hundred participants consented to participate in the study and were administered the CAPS-5 interview. Thirteen participants did not endorse exposure to a Criterion A stressor and were excluded from the final analyses. The final sample comprised of 87 participants, 34 men (39.1%) and 53 women (60.9%), with an average age of 38.1 years ($SD=11.7$). Over half of the participants were White/Caucasian (71.3%), with 17.2% East or South Asian and the remaining proportion consisting of Hispanic/Latino and/or African descent. Based on the CAPS-5, 32 participants met criteria for current PTSD, with 8 meeting criteria for dissociative subtype of PTSD. Fifty-five participants were in the clinical range for MDD (PHQ-9 total scores ≥ 8) (Manea et al., 2011). Among them, 27 participants met the diagnostic criteria for PTSD and possible co-morbid MDD.

At the time of the study, 49 (46.3%) of participants disclosed at least one current mental health diagnosis from a mental health professional. Among them, 22 (44.9%) endorsed a diagnosis of anxiety, and 19 (38.8%) reporting a current diagnosis of depression and/or PTSD.

Thirty-seven (42.5%) participants of the final sample reported receiving past mental health treatment from a psychologist, a psychiatrist and/or other mental health professional ($n=25$, 28.7%). At the time of the study, 33 (37.9%) participants reported receiving current mental health treatment from at least one mental health professional. Among them, 10 (11.49%) participants were receiving some form of Cognitive Behavioural Therapy (CBT). Only three participants reported currently receiving trauma-specific psychological interventions (e.g., Cognitive Processing Therapy and/or Eye Movement Desensitization and Reprocessing [EMDR]). Thirty-two participants reported that they were currently taking at least one psychotropic medication for mental health.

In terms of trauma exposure, the most common event type was physical assault ($n=66$; 75.9%), transportation accidents ($n=61$; 70.1%) and unwanted and/or uncomfortable sexual experiences ($n=52$; 59.8%). Participants' index trauma had occurred on average 13.3 years ago ($SD=12.8$). Sixty-five participants (74.7%) attributed their worst index trauma to some form of interpersonal trauma exposure in child or adulthood. In this study, interpersonal trauma was defined as the deliberate perpetration of harm from another individual through psychological, physical and/or sexual violence (Mauritz et al., 2013). More than half of these participants ($n=46$; 52.8%) endorsed direct exposure to prolonged interpersonal trauma perpetrated either by a family member or intimate partner.

Measures

Trauma Exposure

The Lifetime Events Checklist for DSM-5 (Extended Version) (LEC-5; Weathers, Blake, et al., 2013b) was used to screen for exposure to potentially traumatic events (PTE) in a respondent's lifetime and to establish the trauma exposure index for the current study. It consists of 16 known events and an additional item assessing any stressful life events not listed. Respondents indicated whether their level of exposure

each PTE on a 6-point nominal scale. This included direct exposure, witnessing it happening to someone else, learning about it happening to close family members or friends or exposure as part of one's job (e.g., paramedic, police). Following this, participants were asked to identify and briefly describe the worst event they experienced, that is, the event that they classify as currently being the most distressing. This event was used to identify the reference trauma for assessing current symptoms of PTSD in the CAPS-5 and for the trauma-related shame measure. The LEC has demonstrated adequate psychometric properties as a stand-alone measure for trauma exposure (Gray et al., 2004). In the current study, the total number of trauma categories endorsed, was summed to yield a total score for Trauma exposure.

Trauma-related Causal Attributions

The Expanded Attributions Style Questionnaire (EASQ; Peterson & Villanova 1988) was adapted to measure causal attributions for their worst index event as per Reiland et al., (2014). The EASQ is a measure used to assess a respondent's tendency to generate specific causal attributions for hypothetical aversive events. In this study, trauma related attributions were elicited by asking participants to rate the cause of each traumatic event (including their reference trauma) according to the LEC (Weathers et al., 2013b) on the dimensions of Internal-External, Stable-Unstable and Specific-Global (Reiland et al., 2014). On this scale, respondents are asked to rate the cause of each event on 7-point Likert scale for three causal dimensions; (1) Internal or External ("Is the cause something about you or about other people and/or circumstances"). Following this, whether the internal or external cause was (2) Stable or Unstable ("In the future, will this cause be present?") and (3) Specific or Global ("Is this cause something that affects just this type of situation or does it influence other aspects of your life?"). A total score is computed by summing the average of all three causal dimensions to yield a score between 0 and 7. Higher scores on the scale indicate higher levels of internal, stable and global attributions. The EASQ demonstrated adequate to good internal consistencies (Peterson & Villanova, 1988).

Trauma Related Shame

The Trauma Related Shame Inventory (Øktedalen et al., 2014) was used to assess current symptoms of trauma related shame. The TRSI assesses the cognitive-affective and behavioural components of shame. Respondents are asked to rate the extent that they experienced thoughts and feelings associated with shame related to their reference trauma in the past week on a 4-point Likert Scale 0 (*Not true of me*), 4 (*Completely true of me*). Sample items include items related to negative self-evaluation (e.g., "Because of what happened, I am disgusted with myself") and condemnation and rejection from others (e.g., "If others knew what happened to me, they would be ashamed"). The scale consists of two subscales: internal and external shame. Both internal and external shame subscales can be summed together to yield a composite Trauma-related shame score. The TRSI has demonstrated strong content and con-

struct validity and discriminate validity from a related, albeit distinct self-conscious emotion, guilt measured by the Guilt Cognitions Scale (Kubany et al., 1996).

Depression

The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2002) is a 9-item screening measure used to quantify symptoms of depression severity. Respondents are asked to rate the frequency with which they have been bothered by symptoms of depression in the past two weeks on a 4-point Likert scale 0 (*Not at all*), 3 (*Nearly every day*). Items on the PHQ-9 correspond to specific DSM-IV criteria for Major Depressive Disorder (MDD). Sample items include symptoms related to concentration (e.g., “Trouble concentrating on things such as reading the newspaper or watching television”), and low mood (e.g., “Feeling tired of having little energy”). Items are summed together with total scores ranging from 0 to 27. The PHQ-9 has been validated across different patient settings with sound psychometric properties (Beard et al., 2016; Chagas et al., 2013; Kroenke & Spitzer, 2002; Sidebottom et al., 2012).

Data Analysis

An a priori power analysis was conducted. A sample size of 90 ($N=50+8 K$) for testing multiple correlations and sample size of 109 ($N=104+K$) for testing partial correlations, where N =number of participants and K =number of predictors (Green, 1991). Based on the recommendations of the two approaches, the recommended minimum number of participants for the current study was 109.

All statistical analyses were conducted using SPSS Statistics Version 27. Descriptive statistics and correlations between main variables were reviewed. Kolmogorov-Smirnov tests indicated that shame, depression, and PTSD variables violated assumptions of normality. Consequently, Spearman’s Rho was used in lieu of Pearson’s product-moment to assess the correlations between variables. Correlation coefficients up to 0.30 were interpreted as low, between 0.30 and 0.50 as medium and those above 0.50 interpreted as large (Cohen, 1988).

For the first hypothesised model, mediation analysis was performed using Model 4 of Hayes’ PROCESS macro (Hayes, 2017). Total internal, stable, and global attributions (Trauma related causal attributions) score was entered as the independent variable, trauma-related shame as the mediator and PTSD symptoms as the dependent variable. Time since worst trauma and trauma exposure were entered as covariates.

To examine whether the magnitude of the mediation effect is conditional on the value of the moderator (Muller et al., 2005), PROCESS Macro Model 59 (Hayes, 2017) was constructed with depression added as a moderating variable (Fig. 1).

We ran both models using 5,000 bootstrapping iterations. The resampling method minimises bias that arises from non-normal sampling distributions. Indirect effects are significant when the 95% Confidence Interval (CI) does not contain zero. Effect sizes for the indirect effect between 0.01 and 0.08 are classified as small, 0.09 to 0.24 as medium and 0.25 above as large (Preacher & Kelly, 2011).

Table 1 Mean and Standard Deviation of Trauma exposure, Trauma-related causal attributions, Shame, Depression and Posttraumatic Stress Disorder Symptoms

Variable	M(SD)	Range	α
Exposure	6.6 (3.3)	1–16	-
Attributions	5.12 (3.3)	1.44–5.12	-
Shame	23.3 (19.7)	0–62	0.97
Depression	10.4 (7.3)	0–27	0.91
PTSD	22.0 (14.7)	0–65	0.85

Table 2 Correlations between Trauma exposure, Trauma-related causal attributions, Shame, Depression and Posttraumatic Stress Disorder Symptoms

Variable	PTSD	Exposure	Depression	Attributions	Shame
Exposure	0.25*	-			
Depression	0.72**	0.33**	-		
Attributions	0.36**	0.13	0.25*	-	
Shame	0.62**	0.27*	0.71**	0.26*	-

Results

Descriptive Statistics and Correlations

The means, standard deviations, and correlations for each of the study variables are provided in Table 1. Participants reported an exposure to an average of 6.6 distinct trauma types throughout their lifetime. Correlations between key study variables are reported in Table 2. Depression had relatively strong significant associations with PTSD symptoms and trauma-related shame. Further, trauma-related causal attributions had medium-sized associations with PTSD symptoms and trauma related shame.

Mediation Analysis

Negative attributions and trauma-related shame accounted for significant variance in PTSD symptom severity after controlling for lifetime trauma exposure and time since index trauma $F(4,82)=15.78$, $R^2=0.44$, $p=.00$. See Fig 2 for the direct effects. All direct effects were significant. Shame significantly mediated the relationship between trauma-related causal attributions and PTSD symptoms $\beta=0.15$, 95% CIs [0.04 to 0.26], exerting a significant medium effect. Further, when trauma related shame was included in the model, the direct effect of trauma-related causal attributions remained significant. Trauma-related shame also accounted for 42.7% variance of the total effect. Thus, it is likely that there are additional mediators that could contribute to understanding the effect of negative trauma attributions and PTSD symptoms. The model explained 12.8% of variance in shame, and 43% of variance in PTSD symptoms.

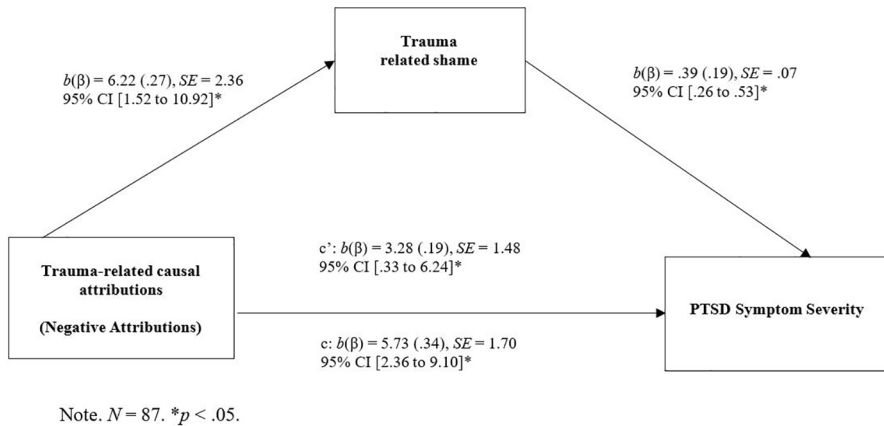


Fig. 2 Proposed Moderation-Mediation model

Table 3 The moderating effect of depression on attributions, shame, and PTSD symptoms

	Mediator variable: Trauma related shame				Dependent variable: PTSD symptoms			
	<i>b</i>	<i>SE</i>	<i>p</i>	95%CI for <i>B</i>	<i>b</i>	<i>SE</i>	<i>p</i>	95%CI for <i>B</i>
Control variables								
Exposure	0.07	0.52	0.89	-0.97 to 1.11	0.15	0.35	0.67	-0.54 to 0.84
Time Since Trauma	-0.08	0.13	0.55	-0.33 to 0.18	0.07	0.08	0.41	-0.10 to 0.23
Predictors								
Attributions	4.27	3.14	0.18	-1.96 to 10.51	5.83	2.20	0.01	1.46 to 10.21
Shame					0.07	0.13	0.59	-0.19 to 0.32
Depression	2.26	0.87	0.01	0.53 to 3.99	1.02	0.59	0.00	0.84 to 3.20
Interaction 1	-0.17	3.13	0.18	-1.96 to 10.51	-0.33	0.18	0.07	-0.68 to 0.03
Interaction 2					0.01	0.01	0.47	-0.01 to 0.03
R^2	0.46*				0.60*			
<i>F</i>	14.06				16.75			

Note. $N = 87$. Interaction 1 = Attributions x Depression; Interaction 2 = Shame x Depression

* $p < .05$

Moderated Mediation

The overall moderated mediation model was significant $F(7,79) = 16.75$, $R^2 = 0.60$, $p = .00$. (Table 4). The results indicate that depression severity did not moderate the relationship between trauma-related causal attributions and shame or to PTSD symptoms (path 'a' and path 'c' Fig 1). The effect of depression severity in the relationship between shame and PTSD symptoms was also not statistically significant (path 'b' Fig 1). Whilst trauma-related causal attributions did not exhibit a significant direct effect on shame, it had a significant direct effect on PTSD symptoms. Trauma-related shame also did not have a significant direct effect on PTSD symptoms. Regardless, depression had both a significant direct effect on trauma-related shame and PTSD symptoms.

Exploratory Analysis

A further parallel mediation model was also investigated as an exploratory analysis. The interested reader is referred to Supplementary File 1.

Discussion

The current study sought provide empirical support for the cognitive concomitants of trauma-related shame. It also extends previous research in several ways. Firstly, it did so by utilising a broad, but trauma-specific measure of both negative attributions and shame to assess the attribution-shame link within a broad sample of trauma exposed survivors. Secondly, it assessed PTSD using a gold-standard interviewer-based measure. Finally, it considered the potential influence of depression on the relationship between negative attributions, shame and PTSD. To the best of our knowledge, ours is the first study to include a gold standard structured interview assessment of PTSD symptoms with a trauma-specific attribution and shame measure for the investigation of these relationships.

Results from the correlation analyses indicated that the associations between negative causal attributions about one's traumatic experiences and shame, depression and PTSD were each of similar magnitude. This suggests that negative attributions may precipitate a broad and non-specific trauma response characterised by shame and depression as much as PTSD. Similarly, correlations between shame, depression and PTSD were each large in magnitude. These results are consistent with both theoretical discussions and empirical findings indicating that individuals who attribute negative events to internal causes that are perceived to be stable and affect all domains across their life are likely to experience shame and are more severe PTSD symptoms (Feiring et al., 1998; La Bash & Papa, 2014).

Consistent with our first hypothesis, both depression and trauma related shame mediated the relationship between negative causal attributions and PTSD symptoms even after controlling for trauma exposure and time since worst trauma. These findings were consistent with previous research which indicate that negative attributions function as a cognitive vulnerability toward PTSD (Elwood et al., 2009), but also that shame mediates this relationship, particularly among both child and adult survivors of CSA (Alix et al., 2017; Feiring et al., 2002; Uji et al., 2007), and a range of adult trauma survivors (Seah & Berle, *in press*). However, the current study extends these findings by assessing the model across different trauma types and tethering attributions and shame to an endorsed worst trauma event and PTSD symptoms assessed using a clinician rated diagnostic interview.

Our results indicate that negative attributions were more strongly related to trauma-related shame than with depression. It is possible that this was due to a measurement artefact. Specifically, participants were asked to endorse causal attributions and shame related to their traumatic experiences. In contrast, depression was measured as a global emotional state, and the extent to which participants endorsed depressive symptoms were influenced by their trauma, is unclear.

Conversely, our findings reveal that depression had a stronger relationship to PTSD compared to shame and PTSD. This is unsurprising given the strong co-morbidity between depression and PTSD and symptom overlap between the two (O'Donnell et al., 2004). However, there is emerging evidence suggesting that the strong co-occurrence is more than just measurement artifact. Rather, as argued by Flory & Yehuda (2015), depression may be a trauma-related subtype of PTSD, evidenced by strong biological and risk correlates between MDD and PTSD.

Contrary to our second hypothesis, the results indicated that depression severity did not influence the relationships in the proposed mediation model. Interestingly, except for negative attributions and PTSD, the other direct effects were non-significant. Although speculative, it is possible that other pre-morbid risk factors such as trait-related shame and attributional style may have accounted for additional variance. It is also possible that these non-significant findings were due to the strength of the relationship between depression, shame and PTSD which assumed a larger proportion of variance in the model. This likely reflects the high co-morbidity rates and symptom overlap between both disorders (e.g., sleep disturbance, concentration difficulties). Regardless, the findings indicate that negative attributions may reflect a common transdiagnostic process in both depression and PTSD as previously suggested by Gonzalo et al. (2012).

Several limitations are worth considering when interpreting the current findings. Firstly, whilst the mediation analyses implies a causal relationship between variables, the cross-sectional design precludes any causal inferences. Thus, future studies should aim to employ prospective designs that assess the temporal relations between variables and the stability of constructs over time. Secondly, the current sample was relatively small and predominantly of White Caucasian descent and biased toward participants who were familiar with the use of social media and Prolific Academic. Thus, future studies should seek to extend recruitment to a broader and larger sample to increase generalizability and statistical power. Third, depression symptoms were assessed using a self-report measure, which may have led to under- and over-reporting of symptoms, whereas PTSD diagnoses were based on clinician interviews. Future research may seek to utilise a structured diagnostic interview such as the Structured Diagnostic Interview for DSM-V (First et al., 2015) to obtain a more accurate depression diagnosis.

The current study has important clinical implications. If negative attributions are also predictive of trauma-related shame and PTSD, they provide an avenue for targeted intervention. Cognitive based interventions including attribution retraining and cognitive restructuring are clinically indicated for PTSD (Boeschen et al., 2001; Resick et al., 2002; Smucker et al., 2003). As negative attributions are a cognitive component of shame, it is expected that targeting maladaptive appraisals of responsibility would reduce concomitant emotional states such as shame and promote trauma recovery. There is also emerging research suggesting that integrating self-compassion-based interventions as an adjunct or standalone treatment, may also have significant clinical utility in ameliorating both shame and PTSD (Arimitsu & Hofmann, 2017; Au et al., 2017; Proeve et al., 2018). Nevertheless, the continuation of longitudinal research will still be necessary to clarify the proximal and directional nature of negative attributions, shame, and PTSD.

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Statement and Declarations

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