The role of trauma-related shame and attributions in posttraumatic stress disorder

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the degree of

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under the supervision of

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Certificate of Original Authorship

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This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Statement of Thesis Format

The present work is in the format of thesis by compilation comprised of six published and unpublished peer review papers, including an Introduction and Discussion. Linking text is provided to establish continuity and coherence between chapters. The supplementary materials for each study are presented in the Appendices. APA 7th formatting is used throughout the thesis.

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List of Abbreviations

APA	American Psychiatric Association
BIC	Bayesian Criterion
CAPS	The Clinician-Administered PTSD Scale
CBT	Cognitive-Behavioural Therapy
CPT	Cognitive Processing Therapy
CSA	Childhood Sexual Abuse
DASS	Depression Anxiety Stress Short Form Scale
DBT	Dialectical Behaviour Therapy
DSM	Diagnostic Statistical Manual
EASQ	The Expanded Attributional Style Questionnaire
EPT	Emotion Processing Theory
GAD	Generalised Anxiety Disorder
IE	Imaginal Exposure
IPV	Intimate Partner Violence
IRRT	Imagery Rescripting and Reprocessing Therapy
LEC	Lifetime Events Checklist
MAR	Missing at Random
MDD	Major Depressive Disorder
MI	Multiple Imputation
MICE	Multiple Imputation by Chained Equations
MVA	Motor Vehicle Accident
PCL	Posttraumatic Stress Disorder Checklist
PE	Prolonged Exposure
PFGT	Present Focused Group Therapy

PHQ   Patient Health Questionnaire

ProA   Prolific Academic

PTSD   Posttraumatic Stress Disorder

PTSS   Posttraumatic Stress Symptoms

PTE   Potentially Traumatic Event

RCT   Randomised Controlled Trial

SAS   Statistical Analysis Software

SPSS   Statistical Package for the Social Sciences

TF-CBT   Trauma Focused Cognitive Behaviour Therapy

TFGT   Trauma Focused Group Therapy

THQ   Trauma History Questionnaire

TOSCA   Test of Self-Conscious Affect

TRGI   Trauma Related Guilt Inventory

TRSI   Trauma Related Shame Inventory

TE   Traumatic Event

UR   Unstructured Covariance Structure

WMH   World Mental Health

Abstract

Shame is a common posttraumatic response that is both associated with and predictive of posttraumatic stress disorder (PTSD). The present program of research extends both theoretical our understanding of shame, and PTSD, as well as the cognitive antecedents of these. Drawing from theoretical models of shame, it investigated whether appraisals of causality or cognitive attributions were related to shame and PTSD. Using a broad shame measure, Study 1 examined the relationship between shame and PTSD. It also investigated whether this relationship would be influenced by both trauma type and cumulative trauma exposure. Results indicated that exposure to a higher number of traumatic experiences and to interpersonal traumatic events were associated with endorsement of shame. Study 2 extended findings from Study 1 by utilising a trauma specific shame measure in a prospective study. Results demonstrated that shame maintains PTSD symptoms regardless of time since trauma exposure.

Studies 3-5 investigated the link between cognitive attributions, shame, and PTSD. To our knowledge, there has not been a qualitative or quantitative synthesis of the existing findings. Accordingly, Study 3 sought to fill this gap by systematically reviewing peer review articles between 1980 and 2022. Results indicated that individuals who make internal causal attributions for their traumatic experiences, endorse higher levels of shame and more severe PTSD. However, there is still limited research in this area, with majority of studies investigating these relationships among female interpersonal trauma survivors. Study 4 provided empirical support linking internal, stable, and global attributions to shame and PTSD in a large trauma exposed cohort. Findings indicated that these attributions mediated the relationship between shame and PTSD. Study 5 replicated the findings from Study 4 in an independent cohort of trauma survivors using the gold-standard semi-structured interview, the Clinician-Administered PTSD Scale for DSM-5 to establish a current diagnosis of PTSD

and to quantify symptom severity. Findings across preceding studies provided empirical support linking shame and PTSD, however it was unclear whether these relationships generalise to clinical treatment seeking populations. Accordingly, the final study, Study 6 investigated whether shame maintains PTSD across treatment, and its response to existing PTSD treatment protocols. Results indicated that more robust individual or adjunctive follow-up treatment is needed to ameliorate shame.

Overall, this program of research enriched our conceptualisation of trauma-related shame and offered insight into the underlying cognitive mechanisms of shame and PTSD. Implications for clinical practice and additional areas for future research were also discussed.

Keywords: Shame, posttraumatic stress disorder, cognitive model, attributions, negative appraisals

Chapter 1. Introduction

Trauma Exposure

Exposure to traumatic, stressful, and potentially life altering events are a common part of the human condition. World Mental Health (WMH) epidemiological surveys estimate that at least 70% of the population will be exposed to at least one potentially traumatic event (PTE) (Benjet et al., 2016; Kessler et al., 2017; Mills et al., 2011) in their lifetime. According to the most recent epidemiological data, traumas occurring to someone else, such as the unexpected death of loved ones were the most common (Kessler et al., 2017). In terms of direct exposure, these include those involving accidents, physical accidents, major illness and disease, physical and intimate partner violence (IPV) (Kessler et al., 2017).

Posttraumatic stress disorder (PTSD)

Following the aftermath of a traumatic event (TE), most people experience posttraumatic stress reactions or symptoms (PTSS) such as nightmares, intrusive memories, and elevated startle response. These symptoms can be considered as normal human responses to extreme stress, and for most, these symptoms spontaneously resolve with time (Layne et al., 2007). However, in a subgroup, these symptoms persist and reach an intensity and frequency that develop into posttraumatic stress disorder (PTSD) (Kessler et al., 2017; Rothbaum et al., 1992).

According to The Diagnostic and Statistical Manual of Mental Disorders (DSM), PTSD is the only mental health condition that requires exposure (direct or indirect) to an event that involves death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence (American Psychiatric Association [APA], 2022). Subsequently, a diagnosis requires the person to have experienced at least one month of a combination of symptoms. These include hyperarousal, persistent and intrusive re-experiencing of the

trauma, avoidance of trauma reminders, and negative alterations in cognition and mood

(APA, 2022). Together, these symptoms are associated with a cascade of physiological and

psychological injuries which contribute to a significant burden of disease; risk of chronic

disease, premature mortality and other psychiatric comorbidities such as substance abuse

disorder, depression and anxiety and an elevated risk of suicide (Gradus, 2018; McGowan,

2019).

Complex PTSD

Following its introduction into the Diagnostic Statistical Manual of Mental Disorders

(DSM-3; APA, 1980), there have been criticisms that the PTSD diagnosis overlooks clinical

presentations resulting from multiple, prolonged and/or developmental trauma exposures

(Cloitre et al., 2009; Herman, 1992a, 1992b; Spinazzola et al., 2005). In the effort to account

for this, Complex Posttraumatic Stress Disorder (CPTSD) was proposed as a distinct clinical

syndrome involving emotion dysregulation, somatization, alterations in consciousness, self-

concept, interpersonal relationships, and sustained beliefs related to morality following

prolonged victimisation (Herman, 1992a, 1992b).

Since then, there have been continued efforts to conceptualise, assess and substantiate

the clinical characteristics of CPTSD.[1] Despite variability across descriptions of specific

symptoms and features of CPTSD, almost all CPTSD definitions include disturbances of self-

concept (DSO)[2] as a core feature (Cloitre et al., 2011; Resick et al., 2012).

Nevertheless, the inconsistencies in the theory and research supporting the construct

validity of CPTSD,[3] its distinction from PTSD (Bryant, 2012; Resick et al., 2012), as well as

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[1] See Resick et al. (2012).
[2] Disturbances of self-organisation include emotion regulation difficulties, negative self-concept and difficulties with relationships.
[3] These inconsistencies relate to a) confounding experiences of complex traumatic events with psychological outcomes related to those events (Cloitre et al., 2011; Cloitre et al.,

evidence suggesting that existing trauma-focused interventions for PTSD might be sufficient to treat individuals with CPTSD (See Cloitre, 2015 and DeJongh et al., 2016), has left clinicians and researchers polarised as to how to conceptualise and treat survivors with complex trauma histories and diverse clinical presentations.

Based on the lack of current evidence and validity (Resick et al., 2012), CPTSD was not incorporated into the as a separate diagnosis within the latest DSM (DSM-5 and DSM-5-TR). Instead, some of the DSO symptoms were incorporated into the broader diagnostic criteria of PTSD (i.e., PTSD Cluster D, alterations in cognition and mood) (APA, 2013, 2022).[4] For the reasons discussed, the scope of this program of research will focus on PTSD as classified within the DSM-5 (APA, 2013) and DSM-5TR (APA, 2022).

Risk factors for PTSD

It is estimated that 5.6% of the population exposed to at least one trauma have a lifetime diagnosis of PTSD, with prevalence rates varying across countries between 0.5% and 14.5% (Koenen et al., 2017). Just as the risk of trauma exposure differs across trauma type, so does the conditional risk of PTSD. Conditional risk refers to the prevalence of PTSD

2012; Courtois, 2004), conflating the term CPTSD with complex trauma (e.g., childhood abuse used synonymously with CPTSD (e.g., Dorrepaal et al., 2010; Lindauer, 2012); b) the events that qualify as complex traumatic experiences to precipitate CPTSD (i.e., repeated interpersonal traumatisation or single incident events; Courtois, 2004); c) symptom profile of CPTSD and d) whether CPTSD is mutually exclusive to PTSD (see Resick et al., 2012).

[4] Efforts to improve the assessment and classification of CPTSD within the empirical literature supports CPTSD as a distinct diagnostic category to PTSD, leading to its inclusion within the the World Health Organization's (WHO) International Classification of Diseases (ICD-11) (WHO, 2022). A diagnosis of CPTSD consists of the three PTSD criteria (re-experiencing, avoidance, numbing and hyperarousal) and three disturbances of self-organisation (DSO) symptoms defined as emotion dysregulation, interpersonal difficulties, and negative self-concept.

among trauma exposed individuals as opposed to overall prevalence of PTSD regardless of traumatic event (Benjet et al., 2016).

To illustrate, it has been found that unexpected death of a loved one, one of the most common traumatic events, has a high average conditional risk of PTSD, whereas direct exposure to death or serious injury, which is also common, is associated with a comparatively low risk of PTSD (Olaya et al., 2015). In contrast, interpersonal traumas such as rape and other sexual assaults are relatively less common but have a much higher conditional risk of PTSD (Liu et al., 2017). Women also have a higher risk of developing PTSD following traumatic exposure (Breslau et al., 2008; Kessler et al., 1995). Although women are more likely to be exposed to interpersonal trauma (e.g., sexual assault) (Breslau et al., 1998; Breslau et al., 2008; Tolin & Foa, 2006), psychosocial and biological factors may better explain differences in PTSD (See Olff, 2017 for a summary).

It is also well established that the cumulative exposure to stressful events enhances the risk of PTSD in a dose dependent manner, whereby the development of PTSD symptoms from prior trauma increases following subsequent traumatic events (Breslau & Peterson, 2010; Bromet et al., 1998). Further, pre-trauma psychopathology, such as maladaptive premorbid psychiatric functioning (DiGangi et al., 2013), also increases the risk of PTSD development and symptom severity due to diminished psychological resources and cognitive dysfunctions that may overlap with trauma aetiology (e.g., negative appraisals) (DiGangi et al., 2013).

Emotional Responses to Trauma

PTSD has historically been classified as an anxiety-related disorder that manifests from ongoing pathological associations between the trauma memory and related stimuli and

excessive fear responses[5] contributing to the perception of current and ongoing threat (Foa et al., 2007; Foa & Kozak, 1986; Foa & Cahill, 2001). Excessive fear responses were outlined in the previous version of the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR; APA, 2000), where endorsement of subjective experiences of fear, helplessness and hopelessness was required to qualify for a diagnosis of PTSD.

However, PTSD researchers have long recognised that trauma elicits a myriad of emotional responses that are not explained by fear-based principles and models such as Emotion Processing Theory[6] (EPT) (Foa et al., 2006; Foa & Kozak, 1986). Incidentally, the recent iteration of the DSM (DSM-5; APA, 2013) has since removed the subjective response of fear, and included *alterations in cognition and mood,* as an additional core symptom cluster, which is comprised of other non-fear-based reactions – such as *shame* as an exemplar response.

Function and Phenomenology of Shame

Shame is a classified as a *self-conscious emotion* as it influences how one sees themselves with respect to others, or how one is to be perceived in the eyes of others (Lewis, 2003; Tangney & Dearing, 2002). Self-conscious emotions are also assumed to have a social function, evolved primarily to address problems and opportunities related to "social survival" (Kroll & Egan, 2004; Lewis, 2003; Tangney et al., 2007), by enhancing cooperation, and maintaining social relationships (Fessler, 2004; Gilbert, 1998; Gruenewald et al., 2007; Kemeny et al., 2004).

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[5] Various theoretical models of PTSD have been proposed. Please see Brewin & Holmes (2003) for a comprehensive summary of various psychological theories of PTSD.

[6] EPT posits that the process of habituation and extinction learning is necessary to correct maladaptive and excessive fear associated with traumatic memories (Foa et al., 2006; Foa & Kozak, 1986). Most theories related to PTSD treatments propose that repeated exposure to the trauma memory is necessary for habituation to, or an extinction of, a fear response, and more recently inhibitory learning (see Craske et al. 2014).

According to several theoretical perspectives, shame signals a threat to the social self; where one's identity is elevated and threatened (Gilbert, 1997; Leary et al., 1995; Scheff, 2003), and there is an actual or potential loss of esteem, acceptance, or status. This occurs either when the individual is implicated in an event that challenges standards of probity (e.g., engagement or involvement in socially sanctioned behaviours), or when the individual fails to meet social standards that are associated with status and worth (Fessler, 2004; Gilbert, 1998; Gruenewald et al., 2007; Kemeny et al., 2004). Phenomenological studies of shame indicate that the emotion poses a threat to social relationships, where individuals report feeling small, inferior and a sense of isolation (Tangney et al., 1996; Wicker et al., 1983) prompting behaviours to facilitate self-preservation (e.g., appeasement, submission and/or conformity) (Dickerson et al., 2004; Gruenewald et al., 2007).

Sources of Shame

Gilbert (1997, 1998) distinguished between external and internal shame, which play different roles in the process of self-evaluation. They defined external shame as the preoccupation with how one is perceived in the eyes of others and associated with beliefs that others will view us as inferior, weak, or inadequate in some way (Gilbert, 1997; Gilbert, 1998). This also occurs in the context where individuals are being shamed by others and there is a real threat of rejection. Conversely, internal shame relates to self-imposed judgement, where one evaluates themselves as inherently flawed and inadequate. According to Gilbert (1997; Gilbert and Andrews, 1998), internal shame occurs when an individual views the traumatic experience as evidence that validates or confirms their view of themselves. Thus, even in the absence of external judgement, an individual may still internalise the belief that they are inherently flawed because of their experience, and expect that others will also view them the same (Gilbert, 1997; Gilbert & Andrews, 1998). Although Gilbert (1997) views

both sources as separate subsets of shame, we can expect that, over time, they reinforce each other.

Shame and Guilt

Shame is often used synonymously with guilt. Both are self-conscious emotions and are strongly related, albeit distinct. Their subtle difference lies in the focus of evaluation, phenomenology, and accompanying affect and action tendencies.

Object of Negative Evaluation. With shame, one's entire self and identity becomes the focus of negative evaluation, (e.g., "I am bad"). In contrast, guilt focuses on perceived transgression (e.g., "I did a bad thing") (Lewis, 1971; Lewis, 2003), which implicates specific behaviours rather than one's entire identity.

In their seminal study, Niedenthal et al. (1994) demonstrated that counterfactual thinking[7] that accompanies shame and guilt, reflects differences in self versus behaviour orientation. When asked to consider or recall episodes of shame, participants were more likely to engage in counterfactual thinking about the self (e.g., "if only I were or were not such a person"), rather than their behaviour (e.g., "if only I had not done such a thing"). Conversely, when participants were asked to engage in counterfactual thinking about their behaviour, they reported higher anticipatory feelings of guilt rather than shame.

Action Tendencies. Shame is a potent, affective response that is precipitated by the view that one is somehow inadequate and unacceptable in the eyes of others (Lewis, 1971; Tangney & Dearing, 2002). It strikes to the core of one's identity and implicates the global self, generating an overwhelming sense of conspicuousness, and the desire to withdraw and hide (Dolezal & Gibson, 2022). Guilt, on the other hand, has its focus on behaviour, leaving

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[7] Counterfactual thinking is defined as judgements of comparisons between appraisals of current reality and the knowledge of or belief about what might have been (Kahneman & Miller, 1986; Einhorn & Hogarth, 1986; Wells & Gavanski, 1989).

the global self, intact. The focus of behavioural transgression results in remorse over one's

actions prompting reparative action such as an apology or rectifying one's behaviour (Gilbert,

2000; Tangney & Dearing, 2002; Tracy et al., 2007).

Shame and PTSD

Shame is a common trauma response that has extensive roots within both the

theoretical and clinical literature (Dahl, 1989; Lewis, 1971), and its role in the aetiology and

development PTSD has recently garnered strong empirical support (Beck et al., 2011;

Leskela et al., 2002; Lowinger & Solomon, 2004; Robinaugh & McNally, 2010; Saraiya &

Lopez-Castro, 2016; Semb et al., 2011; Street & Arias, 2001). Across different age groups,

shame has been found to be associated with specific PTSD symptoms such as hyperarousal,

intrusive recollections (Dewey et al., 2014; Feiring, Taska, & Chen, 2002; Feiring & Taska,

2005) and avoidance (Leonard et al., 2020; Tipsword et al., 2021).

Certain vulnerabilities such as personality traits (e.g., shame proneness) can also

influence the degree of shame experienced posttrauma. In their study, Semb et al. (2011)

assessed both shame proneness and the experience of event related shame by asking

participants to endorse levels of shame on a visual analogue scale when recalling their

traumatic experience. As predicted, they found that higher levels of event related shame

mediated the relationship between shame proneness and PTSD symptom severity.

Whilst these findings suggest that pre-existing risk factors can interact with

peritraumatic responses to increase the severity of PTSS, the use of cross-sectional designs

precludes any inferences regarding the extent to which pre-trauma risk factors interact with

posttraumatic reactions. Further, the use of retrospective measures is limited as it does not

consider the impact of time since trauma and relies on the individual's ability to identify their

emotional state(s) either at the time of the event or time of assessment. Thus, future studies

which assess emotional responses closer to the time of trauma exposure or controls for the effects of time since trauma is warranted.

Trauma Type

Traumatic events do not affect individuals equally and certain trauma characteristics can also influence and elicit distinct emotional responses, accounting for individual variability in trauma responding. Many shame theorists have proposed that shame is likely to be more salient and pathogenic in the wake of interpersonal trauma to generate feelings of shame rather than guilt (Herman, 2012; Herman, 2011; Lee et al., 2001; Wilson et al., 2006).

As noted earlier, shame is defined by its social and interpersonal function as it is also experienced within the broader context of relationships and societal norms (Hareli & Parkison, 2008). It is triggered by a transgression where the self is implicated in some way and signals a threat of rejection (whether inferred, experienced or anticipated), and the whole self is viewed as flawed and unworthy of acceptance and belonging (Brown, 2006).

Interpersonal trauma is a subset of the broader construct of trauma that involves deliberate perpetration of harm toward another (Ozer et al., 2003; Mauritz et al., 2013). This includes, but is not limited to; emotional abuse, sexual assault, physical assault experienced in childhood and/or adulthood (Mauritz et al., 2013). These events typically involve social subordination, humiliation (Herman, 2011) and may signal to the individual that they are worthless or inferior in some way. Indeed, certain trauma types such as child sexual abuse (CSA) carry a degree of social stigma, with phenomenological descriptions provided by survivors involving deep seated feelings of worthlessness, self-loathing and disgust (Kantor et al., 2017; McElvaney et al., 2022; Overstreet & Quinn, 2013; Schomerus et al., 2021).

Shame and PTSD Outcomes

Despite the large and growing collection of empirical work supporting the relationship between shame and PTSD, relatively few studies have examined this relationship using prospective and longitudinal designs (Lopez-Castro et al., 2019). One study found that victims of violent crime who endorsed higher levels of shame one month following victimisation experienced higher levels of shame and PTSD six months after exposure (Andrews et al., 2000). Similarly, in a series of studies, Feiring and colleagues (Feiring, Taska, & Chen, 2002; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005) found that abuse related shame in children was associated with elevated PTSS and poorer outcomes. For example, children who experienced higher levels of shame following CSA discovery demonstrated both higher PTSD and depression symptoms, one year later. They also found that shame experienced in the first year after CSA predicted higher levels of trauma-related shame up to six years following trauma exposure, with accompanying symptoms of hyperarousal and intrusive recollections. Of concern, children higher in abuse related shame demonstrated poorer treatment prognosis compared to those with lower baseline shame (Feiring, Taska, & Chen, 2002; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005).

In contrast, a longitudinal study of Korean sexual assault survivors found that although shame was associated with PTSD symptoms, this relationship fell to non-significance once depression symptoms were accounted for (Shin et al., 2014). This is unsurprising as depression shares overlapping cognitive vulnerabilities with PTSD (Beck, 1976), with a high psychiatric co-morbidity (Flory & Yehuda, 2015). If shame is related to and/or does maintain PTSD symptoms, understanding how and why it emerges within the context of trauma is an important first step. The next section of this chapter will introduce a framework that will guide the other studies within this program of research.

The Cognitive Attributional Theory of Shame

Self-conscious emotions are considered cognitively complex as they involve a series of self-evaluative processes, necessary for their elicitation (Lewis, 2000; Tracy et al., 2007). Drawing from previous theories and research related to causal attributions of emotions (Covington & Omelich, 1981; Jagacinski & Nicholls, 1984; Weiner, 1985), as well as previous theoretical work of shame and guilt (Lewis, 1971; Lewis, 2000; Tangney, 1991), the Cognitive Attributional Theory of Shame (Lewis, 1992; Tracy et al., 2007; Tracy & Robins, 2004) highlights a series of appraisals relevant to shame.

The Cognitive Attributional Theory of Shame (Lewis, 1992; Tracy et al., 2007; Tracy & Robins, 2004) purports that for a self-conscious emotion to occur, the precipitating event needs to be evaluated as personally relevant to one's identity goals (e.g., "Does it matter for who I am or how I want to be?"; Tracy et al., 2007 p.10). As self-conscious emotions serve a social function, these identity goals are situated within the context of interpersonal, social and public evaluation (Baldwin & Baccus, 2004; Kemeny et al., 2004). Beyond this, self-conscious emotions are elicited when there is a perceived threat to one's identity, which can occur privately, where it challenges ideals of how one sees themselves, or publicly, by how they are perceived by others (Leary, 2006). Once it is deemed relevant, internalised standards of social norms and expectations become the ideal against which the individual compares their identity and behaviour (Higgins, 1987; Markus & Nurius, 1986; Wilson & Ross, 2001). From this comparison, the negative self-evaluative components of shame are generated.

Once the event is appraised as self-relevant, causal attribution regarding the precipitating situation is made, a cognitive prerequisite for the elicitation of self-conscious emotions (Lewis, 2000; Lewis, 2003; Tracy et al., 2007). The term *causal attributions* has been used interchangeably with "credit or blame oneself" (Lazarus, 1991), degree of "accountability" (Smith et al., 1993) or "responsibility" (Frijda, 1987). Broadly, events can

be attributed to internal causes; within the individual, or external causes; outside of the individual (Covington & Omelich, 1981; Jagacinski & Nicholls, 1984; Weiner, 1985).

As self-conscious emotions involve evaluation of the self, an internal causal attribution must be made (Tracy & Robins, 2004, 2006). This level of attribution does not refer to attributions in a narrow sense (e.g., "Did *I* cause the event?") rather in broader terms (e.g., "Was it *something about me* that caused the event?"). Tracy et al. (2007) makes this distinction as there are certain events where individuals hold no responsibility or intentionality over the precipitating event, yet still perceive themselves to be implicated in some way.

Beyond the causal locus, attributions extend to the dimensions of stability and globality (Tracy et al., 2007; Weiner, 1985; Weiner, 1991). Stability refers to causes that remain unchanging over time (stable; reason may change) rather than fluctuate (unstable; reason may change). Globality, reflects the idea that causes are generalisable across one's life (global; reason affects my entire self-and/or everything that happens to me) rather than subscribed to specific situations (specific; reason is only applicable to this event or an aspect of myself) (Abramson et al., 1978; Tangney, Wagner, & Gramzow, 1992; Weiner, 1991).

Cognitive Appraisals, Shame and PTSD

Shame and guilt can be considered emotions of self-blame. However, findings linking self-blame to PTSS, are unclear – some studies link self-blame to elevated PTSD symptoms (Andrews et al., 2000; Moor & Farchi, 2011; Peter-Hagene & Ullman, 2018), other suggest it confers a protective mechanism against PTSD (Bulman & Wortman, 1977; Hickling et al., 1999; Lambert et al., 2004).

According to Janoff-Bulman (1979), self-blame consists of two distinct self-attributions; characterological and behavioural. The primary distinction is on the focus of blame, on modifiable factors of the self, such as specific actions or behaviour (behavioural)

or esteem related, more stable aspects of the self (characterological). Arguably, shame is most consistently related to characterological self-blame, as the core attributions are relatively nonmodifiable, stable, and global factors (Janoff-Bulman, 1979; Shaver & Drown, 1986). It is possible that the mixed findings are due to measurement artifacts – where self-blame did not adequately discriminate between characterological and behavioural self-blame (Beck et al., 2004; Startup et al., 2007).

The relationship between appraisals and shame within PTSD can be contextualised within the Cognitive Model of PTSD (Dunmore et al., 2001; Ehlers & Clark, 2000; Ehring et al., 2008; Foa et al., 1999; Halligan et al., 2003; LoSavio et al., 2017). According to Ehlers and Clark (2000), individuals who experience persistent PTSD are unable to experience their trauma as a "time-limited event that does not have negative global implications for their future" (Ehlers and Clark, 2000, p. 320). The model proposes that idiosyncratic appraisals of the trauma and its sequelae lead to emotional responses that produce a sense of current and ongoing threat. This leads to maladaptive strategies intended to mitigate or control threat that paradoxically enhances and maintains PTSD symptoms.

The experience of trauma can generate feelings of shame through attributions of causality to internal, stable, and global causes (e.g., character). This internalised blame becomes a source negative self-evaluation – the individual may see themselves as flawed and defective because of the trauma, which may also be reinforced through external judgement and stigmatisation. Appraisals of trauma symptoms such as flashbacks, intrusive recollections are common reactions following a traumatic event. However, individuals might appraise this as indicators of threat to one's mental health and wellbeing (Ehlers & Steil, 1995; Foa & Riggs, 1993; Foa & Rothbaum, 1998; Jones & Barlow, 1990). The inability to cope could be attributed to one's own competence or as evidence that confirms prior beliefs about their own inadequacy (Janoff-Bulman, 2002). Such appraisals can motivate dysfunctional coping

strategies such as avoidance, thought suppression which only strengthen and maintain symptoms of PTSD (Tipsword et al., 2021; Wegner, 1989).

The experience of shame is a painful and highly aversive emotion. Trauma related cues can elicit ongoing feelings of shame, which can lead to a fear of shame itself (Herman, 2011; Lee et al., 2001; Wilson et al., 2006). In the absence of physical threat, shame becomes a source of internal threat, and something to be avoided. Conversely, threats of rejection whether real, anticipated or imagined, diminishes the sense that the world is a safe place within the context of close relationships and/or social standing within a group (Lansky, 2003; Wilson et al., 2006). Further, the need to withdraw and hide oneself may also lead to other problems such as depression.

Shame strikes at the core of one's identity where negative events are attributed to the intractable and enduring negative self, that is relatively non-modifiable, and affects other situations (e.g., stable, and global attributions). Such appraisals can generate a loss of control and a sense of helplessness over one's future (Abramson et al., 1999; Abramson et al., 1989), maintaining the belief that the trauma is an ongoing event that has global implications for one's future.

Shame and PTSD Treatment

Over the last decade, there has been an accumulation of empirically supported PTSD treatment approaches. Cognitive-behavioural therapy (CBT) approaches remain the first line-treatment for PTSD (Bisson & Olff, 2021; National Institute for Health and Care Excellence [NICE], 2018). These treatments typically focus on a) Explicit emotion processing of traumatic memories through correction of excessive fear associations between the trauma

memory and reminders by way of prolonged exposure (PE) [8], consisting of imaginal exposure

(IE) and in-vivo exposure (Foa et al., 2007; Foa & Rothbaum, 1998), and/or b) Addressing

maladaptive appraisals related to the trauma and its sequalae to address changes in meaning

of the event (Brewin et al., 1996; Schnyder et al., 2015) through cognitive based

interventions such as cognitive processing therapy (CPT) (Resick & Schnicke, 1992).[9]

Although PTSD symptoms typically improve following treatment, up to 25% remain

asymptomatic and experience residual symptoms (Bradley et al., 2005; Larsen, Fleming, et

al., 2019). Unfortunately, even among those who do not meet full diagnostic criteria for

PTSD[10] can still experience significant ongoing impairment, such as diminished socio-

occupational functioning, elevated rates of psychiatric comorbidity and ongoing healthcare

utilisation (Breslau et al., 2004; Marshall et al., 2001; Zlotnick et al., 2002).

Considering shame's robust association with PTSD, it represents a possible target

within treatment. Unfortunately, there is only limited empirical data on shame's response to

existing trauma focused treatments. This represents the largest gap within the literature.

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[8] Prolonged Exposure (PE; Foa & Rothbaum, 1998) is an exposure-based treatment
aimed at reducing trauma related fear. It consists of psychoeducation and de-arousal
strategies to help patients manage their anxiety. PE consists of 1) Imaginal exposure; patients
describe the events in detail and process the emotion through vivid engagement with the
trauma memory, 2) In-vivo exposure; patients approach trauma-related reminders outside of
session to reduce avoidance and to developing coping strategies to confront feared stimuli
and the associated emotions.

[9] Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992; Resick et al. 2006) is
a CBT approach aimed at challenging and modifying unhelpful beliefs related to trauma.
Treatment components include psychoeducation, regarding the relationship between PTSD,
thoughts and emotions. Subsequently, these skills are used to modify unhelpful beliefs about
the trauma. Other themes such as safety, trust, power, control, esteem, and intimacy are also
explored.

[10] There are a proportion of people who may not been full PTSD criteria but exhibit
symptoms that are clinically significant and cause significant functional impairment. These
symptoms may be classified as partial or sub-threshold PTSD. Although there is no
established definition, it is most usefully defined as those meeting two or three of the DSM-5
Criteria for PTSD (Criteria B-E) (McLaughlin et al. 2015).

Interestingly, across four randomised controlled trials (RCTs), several treatment approaches reported significant reductions in symptoms of shame when shame was measured as a secondary outcome, with no apparent differences across the different treatments. For instance, CPT (Resick et al., 2016; Resick & Schnicke, 1992) and its separate components (written accounts and cognitive therapy) (Resick et al., 2008), PE and modified PE with imagery rescripting (Øktedalen et al., 2015), and Dialectical Behavioural Therapy[11] (DBT) (Linehan, 1993) compared with DBT combined with PE (Harned et al., 2014) all indicated significant reductions in self-reported shame from pre-treatment to post-treatment. Although promising, three out of four of these studies were restricted to sexual assault survivors, limiting generalisability to other trauma exposed populations where shame may not be the salient emotional response.

If shame is a core feature that maintains PTSD – it not only represents an important target within treatment, but also a potential mechanism that influences treatment response. For example, when compared to a waitlist-control group, adult female survivors of child sexual abuse (CSA) who received either Present Focused-Group Therapy[12] (PFGT) or Trauma-Focused Group Therapy (TFGT) (Classen et al., 2001; Classen et al., 2011) exhibited significant reductions in shame (Ginzburg et al., 2009). Notably, both treatments resulted significant reductions in shame. Shame's strong relationship with PTSD was also

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[11] Dialectical Behaviour Therapy (DBT; Linehan, 1993) was originally developed as a CBT based approach to treat borderline personality disorder (BPD). DBT typically involves individual therapy and group skills training aimed at reducing dysfunctional behaviours (e.g., suicidal/self-injurious behaviours).

[12] Trauma and Present-Focused Group Therapy (TFGT and PFGT; Classen et al. 2001) is a manualised group intervention. TFGT involves activation and exploration of trauma memories to provide patients with an understanding of the impact of trauma on their sense of self, interpersonal functioning, and affective experiences. It also aims to restructure unhelpful cognitive beliefs and emotions that impact current functioning. In PFGT, the focus is on the impact of maladaptive expectations and behaviours that emerge in group therapy and developing interpersonal skills and affect-regulation strategies. The goal of PFGT is to modify unhelpful patterns of relating to others by restructuring one's view of themselves and others.

noted. In the active treatment component, shame mediated changes in treatment response, accounting for at least a third in PTSD symptom improvement, however these changes were not associated with changes in guilt. These findings further implicate that shame may be the dominant emotional response to target, when treating interpersonal trauma survivors. Indeed, preliminary data from a Norwegian inpatient trial demonstrated a temporal relationship between changes in shame and PTSD improvement. Weekly in-treatment data found that changes in shame preceded changes in PTSD, however the reverse was not found (Øktedalen et al., 2015). This further indicates that targeting shame may be an important mechanism toward improving treatment outcomes.

Summary and Areas to be addressed

The current body of work seeks to establish further empirical support for the relationship between shame and PTSD by using existing validated measures of shame. The research will also focus on the role of causal attributions as a potential antecedent toward shame that can be used to identify the presence of, and target shame.

To date, there is no clear consensus on how to operationalise shame as a construct. Unfortunately, this has led to measurements that reflect a researcher's own approach, many of which overlap with guilt and self-esteem (Andrews et al., 2002; Cook, 1987; Tangney & Dearing, 2002). Although majority of studies investigating the role of shame and PTSD have provided relative convergence within the literature, the use of non-validated measures and lack of clear operational definitions undermines the reliability of findings (Saraiya & Lopez-Castro, 2016).

As indicated, shame and guilt have distinct features, which could have different implications for psychological adjustment (Lee et al., 2001; Tangney & Dearing, 2002; Wilson et al., 2006) and in some instances, shame and guilt may have an opposite effect on PTSD (Leskela et al., 2002; Street & Arias, 2001). An assessment of shame that includes

overlapping constructs could result in researchers erroneously concluding that it is not relevant to the variable of interest (Øktedalen et al., 2014; Tangney & Dearing, 2002). To effectively understand and conceptualise the relationship between shame and PTSD, an appropriate measure needs to be used. This extends to clinical settings, where shame is not easily volunteered due to fear of judgement, and in some cases, is masked by other related emotions, like guilt (Blum, 2008). Failing to accurately assess and identify the presence of shame could leave it unaddressed, potentially worsen outcomes (Elison et al., 2014; Schoenleber & Gratz, 2018), and inhibit future help seeking (Candea & Szentagotai, 2013).

The key to identifying posttraumatic shame is through understanding its role as a self-evaluative emotion, and how it arises in the context of trauma exposure. Shame is a relational affect as how one perceives themselves is inextricably linked to the real or imagined perspective of another (Gilbert, 2007; Harder & Lewis, 1987; Wilson et al., 2006). Trauma that occurs in a relational context can undermine an individual's sense of self and lead to feelings of inferiority and social inadequacy, central to the affect of shame (Beck et al., 2011; La Bash & Papa, 2014; Street & Arias, 2001). Thus, assessment of trauma history and exposure can help identify potential sources of shame and risk factors for PTSD.

Shame is not only an affective and behavioural response but arises through a series of cognitive appraisals; causal attributions being a central component (Tangney & Dearing, 2002; Tracy et al., 2007). It stands to reason that following exposure to traumatic events; individuals will be motivated to assign meaning and responsibility for their experiences. Considering this, the Cognitive Attributional Theory of Shame (Lewis, 2000; Tracy et al., 2007) provides a framework to investigate the role of attributions in the context of shame and PTSD.

As discussed previously, historical conceptualisations of PTSD have classified it as an anxiety-based disorder with fear based emotions being the central focus of PTSD treatment

(Foa et al., 2006; Foa & Kozak, 1986; Foa & Cahill, 2001). However, shame is classified a self-conscious emotion and a non-fear-based emotion, which may not fit within a fear-based treatment model for PTSD.

Given the influence of shame on PTSD, it may be an important target mechanism to improve treatment outcomes. If so, the first step is to establish whether shame maintains PTSS in the absence of treatment. Shame is a painful and aversive emotion that is bypassed or avoided (Lewis, 1971). Attempts to repress feelings of shame can leave it dormant, and only brought into consciousness potentially years after a negative event. Thus, there may be a delay in symptom expression not otherwise identified through cross-sectional research or immediately following trauma exposure. Similarly, PTSD runs a variable course, characterised by delayed onset, and inconsistent non-linear patterns of recovery (Bryant et al., 2015; Galatzer-Levy et al., 2018; Lowe et al., 2021; Osenbach et al., 2014; Santiago et al., 2013). Accordingly, there is scope to extend current prospective studies to assess traumas occurring throughout the lifespan and including participants with complex trauma histories to be more reflective of clinical practice.

The extent that shame is associated with treatment outcomes, and how it responds to existing evidence-based treatments for PTSD, remains the largest gap within the literature. While RCTs are the gold standard to compare the efficacy and effectiveness of various interventions, they are not always feasible. Thus, leveraging existing treatments to assess routinely collected data may provide an economical and efficient way to investigate outcomes. It will also provide insight as to whether alternative and/or adjunctive treatments are needed to address trauma-related shame.

Study Aims

Participants from five independent samples contributed to the studies within this program of research. All data was collected by the author (RS) of the thesis. The specific aims and focus of each chapter also evolved based on findings from the preceding studies. The overall aim of this program of research was to build and extend on current empirical work linking shame and PTSD. It aimed to do so by:

1. Utilising validated broad and trauma specific measures of shame.

2. Examining the role and influence of trauma type and history.

3. Investigating the role of causal attributions related to shame in the context of PTSD.

4. Analysing the relationship between causal attributions, shame, and PTSD.

5. Assessing whether shame maintains PTSD outside the context of treatment.

6. Analysing shame's response to existing PTSD treatment and its influence on treatment outcomes.

Prelude to Chapter 2

The gap between clinical theoretical interest in shame and empirical findings in relation to PTSD has largely been due to difficulties in the measurement of the construct (Blum, 2008). Whilst various measures of shame exist, they can be classified as 1) state dependent (generalised) which assesses current emotions of shame or 2) dispositional, shame related to a trait like personal characteristic. Generalised shame refers to experiences of shame in particular contexts that do not specifically assess phenomenological, behavioural, and motivational components of shame. Respondents are presented with affective descriptors of shame and guilt and asked to endorse how frequently they experience these emotions and/or the extent to which emotions describe themselves (e.g., Personal Feelings Questionnaire; (Harder, 1990; Harder & Greenwald, 1999)). Conversely, state related measures of shame assess current feelings of shame and guilt at time of assessment (e.g., Differential Emotions Scale (DES) (Izard, 1977) or State Shame and Guilt Scale (SSGS) (Marschall et al., 1994)). Although these measures have strong face validity, responses are influenced by the respondent's ability to identify emotional statements. Moreover, the focus on the evaluation of the self in the absence of situational contexts makes it difficult to distinguish shame from guilt.

The most common measure of shame and guilt is the *Test of Self-Conscious Affect* (TOSCA) (Tangney et al., 2000), which yields a measure of shame- and guilt-proneness. Respondents are presented with a series of common encounters (e.g., "you break something at work and then hide it") followed by brief phenomenological descriptions of affective, cognitive, and behavioural features associated with shame and guilt. The key advantage of this measure is that it does not rely on participant's ability to distinguish between shame and guilt. Further, the authors argue that shame is a painful emotion that can evoke a defensive response and asking participants to endorse the frequency or degree to which they experience

shame may lead to repression or denial. The use of hypothetical scenario measures circumvents this possibility.

The first study utilised the TOSCA to establish whether shame and guilt are independently related to PTSD. It also investigated how trauma type might influence these relationships. Participants with a broad trauma history were included in the study. As such, the potential influence of trauma history and time since trauma exposure were also considered.

Chapter 2. Study 1: Does Exposure to Interpersonal Trauma Influence the Relationship between Shame and Posttraumatic Stress Symptoms?

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Abstract

Although shame is a common emotional response to trauma exposure, it may be precipitated by distinct trauma types. To our knowledge, our study is the first to investigate the relationship between shame and PTSD symptom severity and whether exposure to at least one interpersonal trauma influences the relationship between shame and PTSD symptoms. One-hundred and fifty-seven participants from Australia, Canada, United States, United Kingdom, and New Zealand completed a series of self-report measures. Although shame was significantly associated with PTSD symptom severity, it was not an independent predictor of PTSD when considering anxiety, depression, trauma history and guilt. Participants exposed to at least one interpersonal traumatic event endorsed higher levels of shame and PTSD compared to those who did not. Interpersonal trauma exposure also moderated the relationship between shame and PTSD. Clinical implications and directions for future research are also discussed.

Keywords: Shame, guilt, posttraumatic stress disorder, PTSD, interpersonal trauma

Introduction

Posttraumatic Stress Disorder (PTSD) has long been assumed to be a fear-based disorder (Foa et al., 2007; Foa & Kozak, 1986). That is, PTSD is thought to emerge due to excessive fear responding to trauma related cues and associations which are thought to lead to the perception of a current and persistent threat. This manifests as intrusions and alterations in arousal, cognition and mood (e.g., hyperactivity, flashbacks, nightmares), prompting cognitive and behavioural avoidance (American Psychiatric Association [APA], 2022). Although fear is a primary emotional response to trauma, there have been suggestions that other potentially dysregulating emotions, such as a shame may also contribute to PTSD (Lee et al., 2001; Lopez-Castro et al., 2019).

Shame is a self-conscious emotion elicited through negative self-evaluation, where the individual sees themselves as flawed and inadequate, either in the eyes of themselves and/or others (Gilbert et al., 1994; Lewis, 1971; Tangney & Dearing, 2002). Shame often co-occurs with guilt, an interconnected, albeit distinct emotion. Although used interchangeably, shame and guilt have different implications for behavioural motivations and psychological adjustment (Tangney & Dearing, 2002). Shame is considered more painful and chronic due to the negative global evaluation on the self ("I am bad"), prompting withdrawal, avoidance, and maladaptive coping (Lewis, 2003; Tangney & Dearing, 2002; Tracy et al., 2007). Further, experiences of shame can negatively impact interpersonal functioning as individuals who are more shame prone may tend to distance themselves from others due to fear of judgement (Black et al., 2013). In contrast, guilt condemns behaviour ("I did a bad thing") and tends to motivate positive reparations and facilitate change (Tangney & Dearing, 2002).

Despite the differing conceptualisations and measures of shame, converging evidence indicates a significant moderate association between shame and PTSD symptom severity (Lopez-Castro et al., 2019), and suggestive of shame being predictive of higher levels of

posttraumatic stress symptoms (PTSS) up to six months post trauma (Andrews et al., 2000;

Beck et al., 2011). Preliminary treatment research suggests that changes in shame are also

predictive of PTSD (Øktedalen et al., 2015), making an important target for treatment.

In contrast, findings from a recent systematic review investigating the role of guilt in

the development of PTSD are mixed, with some studies indicating positive significant

relationships with small to large effect sizes, to no relationship at all (Pugh et al., 2015). The

challenge associated with disentangling the relative magnitude of shame and guilt in relation

to PTSD is likely a reflection of study methodology such as measurement artefacts, and

heterogeneity in clinical presentations. Majority of reviewed studies did not control for the

effects of shame despite significant correlations between shame and guilt and shame and

PTSD (Beck et al., 2011; Kubany et al., 1996; Leskela et al., 2002; Lowinger & Solomon,

2004; Robinaugh & McNally, 2010; Street & Arias, 2001). It is possible that the relationship

between both shame and guilt in relation to PTSD may have been confounded by their

construct overlap.

Although PTSD can arise from many different trauma types, variations in trauma

exposure may also account for distinct emotional responses. Consistently, shame has been

found to be the dominant emotional response and a stronger predictor of PTSD symptoms

than guilt among those who report interpersonal trauma (e.g., physical, sexual assault,

interpersonal violent crime (Beck et al., 2011; DePrince et al., 2011; Ford et al., 2006;

Haagen et al., 2015; La Bash & Papa, 2014) compared to those that did not (e.g. natural

disasters, transport accidents etc.) (Ginzburg et al., 2009). This effect was also observed in a

treatment study where shame, not guilt mediated changes in PTSD symptoms among female

survivors of childhood abuse (Dewey et al., 2014; Velotti et al., 2014).

Shame is also considered a "social emotion" as it regulates peer relationships and

social hierarchy and bonds (Gilbert & McGuire, 1998; Lewis, 1971). Interpersonal traumas

involve deliberate perpetration of human violence (e.g., sexual and violence, robbery etc.) (Ozer et al., 2003). These events involve significant relational disruptions, where one is violated in some way at the hands of another. Thus, the experience of shame becomes a source of internalised feelings of worthlessness, helplessness, and threat of potential rejection (Lee et al., 2001; Wilson et al., 2006). Interpersonal traumatic events also represent violations of social norms and relational boundaries. This directly contrasts non-interpersonal events such as natural disasters or unintentional accidents. In this way, shame is likely to be the dominant emotion when exposed to the former.

Another potential risk factor for both shame and PTSD is the number of previous potentially traumatic events (PTEs) (Ozer et al., 2003). The impact of cumulative trauma may give rise to more severe PTSD symptomology and greater distress and co-morbid psychiatric disorders (Briere et al., 2008; Suliman et al., 2009). Individuals with repeated trauma histories may undermine an individual's sense of safety and within the world, and lead to an internalised sense of helplessness following subsequent negative events (Harman & Lee, 2009; Janoff-Bulman, 2002).

The current study sought to provide further empirical support for the relationship between shame and PTSD symptom severity in a broad trauma exposed sample whilst controlling for potential effects of guilt. To account for the high comorbidity between PTSD and other psychiatric comorbidities such as depression and anxiety (Breslau, 2009; Rytwinski et al., 2013), we also controlled for the effects of these relationships. It was hypothesised that shame would be positively associated, and independently predictive of PTSD symptoms even when controlling for number of previous trauma exposures, generalised anxiety, and depression symptoms.

Given that trauma type appears to be a critically important risk factor for the development of shame, there is a need to understand whether trauma type also influences the

relationship between shame and PTSD. In the absence of previous studies answering this question, the study also aimed to examine whether exposure to at least one interpersonal trauma would moderate the relationship between shame and PTSD symptom severity, whilst controlling for the effects of guilt and depression. An investigation into the relationship between shame and PTSD and the possible moderating effects of trauma type could offer greater insight into the variations in psychological responses and potential risk factors toward development of shame and PTSD.

It was predicted that individuals who were exposed to at least one interpersonal trauma across their lifetime would endorse higher levels of shame (rather than guilt) and PTSD symptoms compared to those that did not. It was also hypothesised that interpersonal trauma would moderate the relationship between shame and PTSD symptom severity.

Method

Procedure

Ethical approval for the current study was obtained from the relevant University Human Research Ethics Committee. A series of self-report questionnaires were administered online, and participants were reimbursed at a rate of 5GBP per hour of study completion.

Participants

Participants were recruited from Australia, Canada, Ireland, The United Kingdom, and United States using Prolific Academic (ProA), an online study recruitment platform. Only English-speaking participants who were over the age of 18 and exposed at least one PTE (e.g., crime, physical and/or sexual assault, transport accidents) (Norris & Hamblen, 2004) were included in the study.

One-hundred and eighty-seven participants provided informed consent to participate. Thirty (16.04%) participants did not endorse exposure to at least one PTE over their lifetime and were thus excluded from the study.

The final sample ($N = 157$) consisted of 67 females (42.68%) and 90 males (57.37%) aged between 18 and 67 ($M = 28.9$, $SD = 10.8$). Just over half the sample ($n = 96$; 61.15%) endorsed completing at least one post-school qualification. 81 participants (43%) reported either being in a de-facto relationship or were currently married. Majority of participants (87%) did not endorse having a current or previous diagnosed mental health disorder and any physical health conditions that interfered with their ability to engage with daily living.

Measures

Trauma Exposure

The Trauma History Questionnaire (THQ; Norris & Hamblen, 2004) is a 24 item self-report measure which screens for individual exposure (either direct exposure or witnessing) to common PTEs that would meet a Criterion A stressor in the DSM-V-TR diagnostic criteria for PTSD (APA, 2022). These include but are not limited to crime, sexual and physical assault and/or general disasters by endorsing yes/no. Sample questions include: "Have you ever had a serious accident at work, in a car, or somewhere else?". The number of endorsed events were summed to create a proxy quantification of trauma exposure (Martin et al., 2013). In this study, frequency of trauma exposure over an individual's lifetime is referred to as Trauma Load.

Anxiety

The Generalised Anxiety Disorder 7 (GAD-7; Spitzer et al. 2006) is a 7-item self-report measure used to screen for DSM-IV GAD symptoms. Participants were asked to rate the extent to which they are bothered by symptoms in the past two weeks on a 5-point Likert

scale (0 = *Not at all* to 4 = *Nearly every day*). Items were summed with a total score between 0-21. A score of 10 and higher indicated moderate to severe anxiety. In the present study, the GAD-7 internal consistency was excellent (α = .91).

Depression

The Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002) is a 9-item self-report measure to screen for DSM-IV depression symptoms. Respondents rated the extent they were bothered by depressive symptoms (e.g., "feeling down, depressed or hopeless") on a 4-point Likert scale (0 = *Not at all* to 3 = *Nearly every day*) over the past two weeks. Total scores are summed with a score of between 0-27, with scores of 10 or higher indicating the presence of severe major depression (Levis et al., 2019). The PHQ-9 has demonstrated good convergent and discriminant validity with other depression measures (Beard et al., 2016). The internal consistency of the PHQ-9 in the present study was good (α = .90).

Posttraumatic Stress Disorder (PTSD) Symptoms

The PTSD Checklist for DSM-5 (PCL-5; Weathers, Litz, Keane, et al., 2013) was used to screen for current PTSD symptom severity. The PCL-5 consists of 20-items that correspond to the DSM-5 criteria for PTSD. Participants were asked to consider the event they consider the worst event, or the event that currently bothers them the most. Following this, they were asked to endorse whether they have experienced symptoms in the past month (e.g., In the past month how much were you bothered by: "repeated, disturbing dreams of the stressful experience?") on a 5-point Likert scale (0 = *Not at all* to 4 = *Extremely*). Items are summed for a total score, with a score of 31-33 indicating the presence of probable PTSD. The PCL-5 has demonstrated strong validity and reliability and is a psychometrically sound

measure of PTSD symptoms (Blevins et al., 2015; Bovin et al., 2016). The internal

consistency for the PCL-5 was excellent ($\alpha = .97$).

Shame and Guilt

Shame and Guilt were measured using the shame and guilt proneness subscale on the

Test of Self-Conscious Affect-3 short form (TOSCA-3; Tangney et al., 2000). The TOSCA-3

has the advantage of utilising a scenario-based approach, as it is thought to be less reliant on

the capacity of participants to distinguish between self-conscious emotions (Tangney &

Dearing, 2002). Respondents are asked to imagine themselves in 11 negative hypothetical

situations and indicate the likelihood that they would think in the ways described in each

situation on a 5-point Likert scale (1 = *Not likely* to 5 = *Very likely*). For example, "You

break something at work then hide it". Sample responses include: "You would think…a) this

is making me anxious; I need to either fix it or get someone else to, b) about quitting, c) a lot

of things aren't made very well these days, or d) it was only an accident". Further, the use of

scenario-based measures allowed us to compare individual differences of shame and ensures

consistency in the events that are being rated regardless of their trauma history.

Scale scores are summed to obtain total scores of shame and guilt proneness. The

TOSCA-3 has demonstrated strong internal consistency and construct validity (Rüsch et al.,

2007; Woien et al., 2003). In the present study, the internal consistency for TOSCA-3 shame

and guilt subscales were acceptable ($\alpha = .81$) and ($\alpha = .78$), respectively.

Power Analysis

A power analysis was conducted using G*Power (Faul et al., 2007) which indicated

that 109 participants were needed for a multiple regression analysis with eight predictor

variables, a power of 0.80 for an expected medium effect size of $f^2 = 0.15$.

Data Analytic Strategy

All statistical analyses were conducted using SPSS Statistics (Version 26). As the scores for Depression, Anxiety and PTSD symptoms were positively skewed, Spearman's rank-order correlations were run to determine the relationship between study variables. To assess whether participants previously exposed to interpersonal trauma would endorse higher levels of shame and PTSD symptom severity, Mann-Whitney U tests were conducted, with shame and PTSD symptom severity as outcome variables (Field, 2000).

Multiple linear regression was performed to test the relationship between shame and PTSD symptoms. Due to high rates of comorbidity between depression, anxiety and PTSD (Campbell et al., 2007; Price et al., 2019) and given that depression may arise from shame (Tangney, Wagner, & Gramzow, 1992), the effects of these mental health variables were controlled for. The potential effect of trauma load and guilt were also entered as covariates. To examine whether trauma type moderated the relationship between shame and PTSD symptom severity, moderation analysis using Bootstrapping with 10,000 iterations (Model 1; Hayes, 2013) was performed controlling for anxiety, depression and trauma load.

Results

Trauma Exposure

Participants had been exposed to an average of 3 PTEs across their lifetime (see Table 1). Just over half (52.2%) of participants endorsed exposure to at least one interpersonal traumatic event, reporting higher levels of shame ($Mdn = 85.75$), guilt ($Mdn = 86.23$) and PTSD symptoms ($Mdn = 89.03$), compared to those that were not exposed to at least one interpersonal trauma event ([$Mdn = 70.51$], $U = 2,510.50$, $p = .04$; [Mdn = 67.46], $U = 2,280$, $p = .01$, respectively).

Table 1

Prevalence of Trauma Exposure

Potentially Traumatic Event	*n* (%)	Trauma type
Robbery	28 (17.8%)	Interpersonal
Attempted break in[a]	37 (23.6%)	Interpersonal
Serious accident	46 (29.3%)	Non-interpersonal
Natural Disaster	36 (22.9%)	Non-interpersonal
Manmade Disaster	11 (7.0%)	Non-interpersonal
Exposure to toxic chemicals	13 (8.3%)	Non-interpersonal
Physical Injury	32 (20.4%)	Non-interpersonal
Feared injury or death	38 (24.2%)	Non-interpersonal
Witnessed someone injured or death	39 (24.8%)	Non-interpersonal
Handled dead bodies[b]	30 (19.1%)	Non-interpersonal
Close family or friend murdered or killed by drunk driver	6 (3.8%)	Interpersonal
Close friend or family member die	4 (2.5%)	Non-interpersonal
Life-threatening illness	16 (10.2%)	Non-interpersonal
Received news of serious injury, life threatening illness/death of someone close	103 (65.6%)	Non-interpersonal
Engaged in military service in a combat zone	-	Interpersonal
Sexual Assault and/or any form of unwanted sexual contact[c]	21 (21%)	Interpersonal
Being attacked at knife and/or gunpoint	15 (9.6%)	Interpersonal
Being attacked without a weapon	10 (6.4%)	Interpersonal

| Being attacked by a family member | 27 (17.2%) | Interpersonal |

Note. [a]Includes whether the individual was present during the time. [b]Excluding funerals. [c]This includes any form of unwanted sexual contact. [d]22 out of 27 (17.2%) participants specified the event they endorsed, all of them included psychosocial stressors that would not meet a Criterion A traumatic stressor according to the DSM-5 diagnostic criteria for PTSD. None of the events specified met the definition for an interpersonal trauma event.

Descriptive Statistics and Correlations

The mean, standard deviation, range, and inter-correlations of measures are reported in Table 2. Forty-five (28.7%) participants scored in the clinical range for PTSD (≥ 31; Weathers, Litz, et al., 2013). On average, participants fell within the mild range of anxiety and mild-moderate range for depression. These correlations were small to large in magnitude (Fritz et al., 2012), with anxiety and depression sharing the strongest relationship with PTSD symptoms, followed by shame. Shame and guilt were not significantly associated trauma load.

Table 2

Means, Standard Deviations, Range and Correlations among Study Variables (N=157)

Variable	Mean (*SD)*	Range	1	2	3	4	5	6	7
1. Anx	7.64 (5.37)	0-21	-	.76**	.28**	.46**	.23**	.27**	.65**
2. Dep	9.92 (6.60)	0-27		-	.14	.42**	.24**	.21*	.60**
3. Guilt	45.31 (6.38)	25-55			-	.52**	.11	.19*	.11
4. Shame	37.87 (8.08)	15-55				-	.05	.18*	.32**
5. Load	3.61 (2.53)	1-11					-	.51**	.30**
6. Type	0.52 (0.50)	0,1						-	.28**
7. PTSD	21.15 (20.0)	0-80							-

Note. Anx = Anxiety (GAD-7); Dep = Depression (PHQ-9); Load = Number of cumulative

traumatic experiences; Type = Exposure to at least one Interpersonal trauma; PTSD =

posttraumatic stress disorder (PCL-5).

* $p < .05$ ** $p < .01$.

The Relationship between Shame and PTSD Symptoms

To investigate the relationship between shame and PTSD independent of guilt and

other associated variables, a regression analysis was conducted controlling for the effects of

trauma load, depression, anxiety, and guilt (Table 3). Shame was not an independent positive

predictor of PTSD symptom severity. Both Depression ($B = .60$, $t = 2.10$, $p = .04$) and

Anxiety ($B = .1.69$, $t = 4.7$, $p < .001$) significantly predicted PTSD symptom severity.

Overall, the model was significant, $F(5,151) = 27.24$, $p < .001$) and explained more than 47%

of variance in PTSD symptom severity. When the regressions were re-run as a sensitivity

analysis with only those who were exposed to at least one interpersonal trauma, the pattern of

results were the same (see Table 4).

Table 3

Multiple Linear Regression Analyses Predicting PTSD Symptom Severity

	B	SE	95%CI		β	p
			LL	UL		
Depression	.60	.29	.03	1.17	.20	.04*
Anxiety	1.69	.36	.98	2.40	.45	.00*
Trauma load	1.26	.49	.30	2.22	.16	.01*
Guilt	-.32	.22	-.76	.12	-.10	.15
Shame	.18	.19	-.20	.55	.07	.36

Note. Items 12-14 (Cluster D) and 19-20 (Cluster E) were removed from the PCL-5 to obtain

a total PTSD score which excludes overlapping symptoms with depression. The overall

model was significant, $F(5, 151) = 20.28$, $p <. 001$, explaining 40% of variance in PTSD

symptoms.

*p < .05

Table 4

Multiple Linear Regression Analyses Predicting PTSD Symptom Severity Among Participants

Endorsing Interpersonal Trauma (n = 83)

	B	SE	95%CI		β	p
			LL	UL		
Depression	.95	.38	.18	1.71	.30	.02*
Anxiety	1.33	.48	.38	2.28	.34	.01*
Trauma load	1.30	.64	.02	2.58	.16	.04*
Guilt	-.13	.34	-.80	.54	-.04	.69
Shame	.48	.29	-.09	1.06	.17	.10

Note. The sample was derived from the original sample ($N = 157$). Analyses was run using

only participants who had endorsed at least one interpersonal trauma exposure ($n = 83$). The

overall model was significant, $F(5,77) = 17.77$, $p <.001$, explaining 54% of variance in PTSD

symptoms.

*p < .05

Moderation Effect of Trauma Type on the Relationship between Shame and PTSD

Symptoms

Table 5 presents the estimated regression coefficients testing the moderating effect of

interpersonal trauma exposure on the relationship between shame and PTSD severity. The

interaction term was statistically significant indicating that the effect of shame and PTSD symptoms is contingent on trauma type ($B = .78$, $SE = .30$, $p = .01$). This suggests that the association between shame and PTSD symptoms was stronger among participants who had been exposed to at least one interpersonal trauma compared to those who did not.

Table 5

Trauma Type Moderating the Relationship Between Shame and PTSD Symptom Severity

	B	SE	95% CI		p
			LL	UL	
Outcome: PTSD symptom severity					
Constant	17.17	.23	-2.01	36.35	.08
Shame	-.20	.23	-.65	.26	.40
Trauma Type[a]	-27.90	11.70	-51.1	-4.79	.02
Shame x Trauma Type	.78	.30	.12	2.28	.01
Trauma Load	1.20	.55	.12	2.28	.03
Depression	.56	.28	-.01	1.12	.05
Anxiety	1.62	.35	.92	2.31	.00
Guilt	-.27	.22	-.70	.16	.22
Conditional effects[c]	Effect	SE	95% CI		p
			LL	UL	
Interpersonal Trauma	.59	.25	.10	1.08	.02
Non-Interpersonal Trauma	-.20	.23	-.65	.26	.40

Note. [a]Trauma type is coded as Interpersonal trauma=1, Non-Interpersonal trauma=0. [c] Conditional effects of trauma type on PTSD at values of the moderator.

An additional post-hoc analysis was also conducted to assess whether interpersonal trauma exposure would moderate guilt and PTSD symptoms when controlling for the effects of anxiety, depression, trauma load and shame. Results indicated that interpersonal trauma exposure did not moderate the relationship between guilt and PTSD symptoms.

*$p < .05$

On the basis that there are overlapping symptoms between depression and PTSD (e.g., concentration difficulties, sleep disturbance), we repeated all analyses without any of the common symptoms in the PTSD total score. In the regression analysis, depression did not independently predict PTSD symptom severity, however the overall pattern of results remained the same.

Discussion

To our knowledge, our study was the first to systematically examine the role of shame in PTSD when guilt, trauma exposure and trauma type are considered. The findings are informative for clinicians, who frequently encounter trauma survivors reporting prominent shame, as well as for informing further research.

The first aim was to examine whether shame and guilt independently predict PTSD symptom severity. As hypothesised, shame, not guilt, demonstrated a significant association with PTSD symptom severity, noting that when controlling for anxiety, depression, trauma load and guilt, this relationship fell to non-significance. These findings mirror those of Shin et al. (2014) which found that once depression was controlled for, shame proneness was also not related to PTSD.

The non-significant findings so far as shame independently predicting PTSD may also be an artefact of our measurement of shame and guilt. One of the key advantages noted of the TOSCA is the use of scenario-based items, which limits recall bias inherent in self-report

measures and does not rely on an individual's capacity to identify their emotional states. Conversely, the TOSCA may not capture the intense emotional experiences of a traumatic event that may be phenomenologically distinct from responses to everyday negative situations, with shame proneness functioning as a distal individual vulnerability risk factor exacerbated through trauma exposure and vice versa (Beck et al., 2019; Lee et al., 2001). For example, in a study with violent victim crimes, Semb et al. (2011) found that trauma-related shame mediated the relationship between trait shame and PTSD symptoms.

It is possible that we were less likely to detect an effect due to the inclusion of anxiety and depression as predictors, which share significant variance with PTSD symptom severity. This may be due to high levels of comorbidity between depression, anxiety, and PTSD. Whilst the co-occurrence between disorders is likely due to overlapping psychological and biological vulnerabilities (see Spinhoven et al., 2014), it could also be attributed to diagnostic symptom overlap.

Although speculative, shame may also predict PTSD symptom severity via other psychological mechanisms and trauma related factors. For instance, it may be that cumulative trauma exposure, rather than shame per se, contributes the greatest to PTSD symptoms once anxiety and depression symptoms are considered. Indeed, increased trauma exposure confers a greater risk toward the development of PTSD over time (Martin et al., 2013). Conceivably, the bivariate shame-PTSD relationship could be contingent on trauma load, in that shame may only arise after repeated trauma exposures (Stotz et al., 2015), and is independent of PTSD symptom severity (Hagenaars et al., 2011).

A second objective of the study was to investigate whether the type of trauma exposure would influence the relationship between shame and PTSD symptom severity. Contrary to our hypothesis, individuals exposed to interpersonal trauma endorsed higher levels of guilt as well as higher levels of shame and PTSD symptoms.

Although shame and guilt are theoretically distinct constructs, they are not mutually exclusive, and an individual can simultaneously endorse both feelings of shame and guilt. Further, it is possible that individuals who tend to experience shame are likely to interpret and respond to negative situations that also reflect higher levels of guilt-proneness. Regardless, as predicted, exposure to at least one interpersonal trauma only moderated the relationship between shame and PTSD symptom severity, which is consistent with both theoretical and empirical findings asserting that interpersonal trauma confers a greater risk of PTSD development and experiences of shame (Beck et al., 2011; Feiring & Taska, 2005; La Bash & Papa, 2014).

Interpersonal trauma, particularly sexual/emotional abuse involves a degree of degradation and devaluation of the victim at the hands of the perpetrator (Kennedy & Prock, 2018; Shapiro, 2003). In turn, the individual may be more likely to self-blame, and attribute themselves as flawed and worthless (La Bash & Papa, 2014; Lee et al., 2001). Interpersonal trauma often carries associated social stigma, which in turn may become a source of shame (Dworkin et al., 2017; La Bash & Papa, 2014). It is possible that exposure to interpersonal trauma may place individuals with higher trait shame at greater risk of future psychopathology and PTSD following subsequent exposure to traumatic events. Conversely, exposure to interpersonal trauma may increase an individuals' propensity to interpret and respond to negative situations and thus exhibit higher levels of trait shame on measures such as the TOSCA.

Limitations and Directions for Future Research

The current study has several limitations worth considering and provides directions for future research. First, the use of cross-sectional data precludes any causal inferences. Although the study suggests that shame proneness may be a potential risk factor toward PTSD, with interpersonal trauma survivors having a higher propensity toward shame than

guilt, the use of prospective data is needed to test the predictive effect of shame and PTSD

symptom severity. If so, individuals with higher levels of pre-trauma shame propensity may

be at risk of developing PTSD following exposure to interpersonal trauma. The use of

prospective data can also advance our understanding of how shame emerges at different

phases following trauma exposure, whilst controlling for the effects of individual

predispositions (Bryant, Creamer, O'Donnell, et al., 2017).

Despite its advantages, the scenarios utilised in the TOSCA represent everyday

scenarios that may not be personally relevant or salient, as compared to situations which

would be appraised as highly aversive and potentially traumatic. Thus, future studies may

seek to complement this with a trauma-related shame measure to assess for the differential

relationship between both trait shame and trauma-specific shame (e.g., Øktedalen et al.,

2014) with PTSD and the study's associated variables.

Second, we recruited participants from Prolific, an online recruitment platform, which

may not be representative of the broader population. Further, the sample consisted of

participants within subclinical levels of PTSD, who were predominantly well-educated

individuals engaged in some form of paid employment, which limits generalisability of

findings. Further replication among more diverse populations through other recruitment

methods and within clinical samples, using diagnostic clinical interviews (e.g., The Clinician-

Administered PTSD Scale for DSM-5; Weathers, Blake, et al., 2013a), is warranted.

Finally, although interpersonal trauma exposure was related to both shame and PTSD

as predicted, we only assessed for historical and broad categories of trauma exposure.

However, we can expect PTSD symptom profiles and subsequent reactions to differ

according to the nature of nature of both trauma itself (e.g., sexual versus physical abuse)

(Bucich et al., 2022), or appraisals of the trauma and its sequelae (Ehlers & Clark, 2000;

Tracy & Robins, 2004). Thus, future search could seek to investigate the differential

associations between distinct trauma presentations, individual trauma responses and its influence on shame, guilt, and PTSD symptom typologies.

Conclusion

The current findings suggest that shame is associated with PTSD symptom severity and survivors of interpersonal trauma may experience higher levels of shame and more severe PTSD symptoms. As suggested previously, shame typically prompts physical and psychological withdrawal, which can impair the therapeutic alliance and undermine treatment effectiveness (Black et al., 2013). Thus, clinicians should be mindful of the potential presence of shame through behavioural indicators (e.g., withdrawal, avoidance of eye contact, or redness of the face).

There have been suggestions that shame may impede emotional processing during exposure-based therapies (Cusack et al., 2016; Foa et al., 2007) leading to suboptimal treatment outcomes. Although limited, responses of shame to trauma and non-trauma focused treatment modalities, indicate that shame may be a key response to PTSD symptom improvement and recovery (Ginzburg et al., 2009; Harned et al., 2014; Øktedalen et al., 2015; Resick et al., 2008). The incorporation of emotion focused therapies (e.g., self-compassion therapy; Neff, 2003) as an adjunct to standalone trauma-focused treatments could also be utilised, especially among interpersonal trauma survivors where shame may be more prominent and pathological, noting that further empirical investigation is warranted.

Prelude to Chapter 3

The findings of Chapter 2 (Study 1) indicate that shame, not guilt, was related to more severe PTSD symptoms. Although this was consistent with our hypotheses and the existing literature (Bennett et al., 2016; Ginzburg et al., 2009; Leskela et al., 2002; Pineles et al., 2006; Robinaugh & McNally, 2010; Semb et al., 2011; Street & Arias, 2001), this finding may be due to measurement artefact.

In an effort to delineate between shame and guilt, The TOSCA-3 was designed to maximise the distinction between self-versus behaviourally based appraisals. However, when examining the differences between shame and guilt items, guilt was portrayed as an inherently adaptive response that promotes interpersonal functioning, which might explain its non-relationship with PTSD (Tangney et al., 1995; Tangney et al., 2007). However, the assumption that guilt is only an adaptive emotion, is problematic (Blum, 2008; Ferguson & Crowley, 1997). Regardless, of its positive function, excessive feelings of guilt, like any other emotion can become maladaptive. For example, distorted self-blame can lead to an over-exaggerated or misplaced guilt (Kubany et al., 1995; Lindsay-Hartz et al., 1995). This can lead to excessive rumination, emotion dysregulation and ineffective attempts to make reparations and amends (Mikulincer & Florian, 1997; Nolen-Hoeksema, 2000).

According to Cicchetti et al. (1995), emotions can become maladaptive when they are connected to "cognitive processes and actions that are situationally inappropriate" (Cicchetti et al., 1995, p.6). When examining the individual scenarios of the TOSCA-3 (Tangney et al., 2000), the majority of the scenarios involve some form of interpersonal harm caused to another. Conversely, prosocial action tendencies (e.g., apologising, making amends) would be considered situationally appropriate responses that are socially constructive (Fontaine et al., 2001; Luyten et al., 2002). In contrast, shame items involve negative self-criticism and derogatory responses (e.g., "You would feel small…like a rat"). These responses have been

consistently related to lower self-esteem and thus, correlated with higher levels with psychopathology (Tangney et al., 1995; Tangney, Wagner, & Gramzow, 1992). Although the positive relationship between shame-proneness and PTSD was consistent with expectations, it fell to non-significance once symptoms of depression and anxiety were controlled.

Interestingly, the relationship between shame proneness and depression was stronger than its relationship with PTSD. Personality vulnerabilities such as shame proneness has been theorised to play a crucial role in the development of affective disorders (Shin et al., 2014; Tangney et al., 1995; Tangney, Wagner, Fletcher, et al., 1992). As a trait variable, shame proneness could be considered a distal contributory factor of the symptoms of PTSD in the presence of depressive symptoms, as indicated by the strong co-morbidity between depression and PTSD (Campbell et al., 2007) along with other psychological mechanisms beyond the scope of this program of research.

Despite being theoretically distinct, findings from Study 1 indicate that shame and guilt proneness were still strongly related to each other. However, if we assume that the guilt and shame subscales measure adaptive and maladaptive forms of both emotions, respectively, we might expect an inverse relationship between the two.

The TOSCA uses correlate-based judgements (e.g., thoughts, feelings and behaviours associated with shame and guilt). This operates under the assumption that endorsement of a judgement directly corresponds to the underlying emotion (Dempsey, 2017). It is possible that individuals who indicate that they would make amends or apologise, do so as dictated by social rules, rather than genuine feelings of guilt and/or remorse (Ferguson & Crowley, 1997; Giner-Sorolla et al., 2011). It is also possible that an individual who would be more likely to experience shame in a particular scenario, may deny or downplay the possibility when presented with other options. For example, in the scenario where an individual had broken something from work, they may feel strong feelings of quitting, but recognise that

apologising and making amends is more socially appropriate (Leach, 2017). Similarly, an individual may imagine themselves feeling a certain way, but the likelihood of responding could be much smaller. Thus, the measure also assumes that an individual would feel or act in a certain way presented with a similar situation. However, all self-reports are subject to social desirability responding and contingent on an individual's level of self-awareness.

In Study 1, we attempted to establish the relationship between shame and PTSD, independent of guilt, by statistically controlling for the presence of guilt. Under specific conditions, it may be possible to observe shame separately from guilt (Blum, 2008). Indeed, the TOSCA-3 provides contexts where participants can project their respective shame and guilt reactions to various situations based on hypothetical, everyday scenarios. However, TE are phenomenologically distinct from everyday events, and in these cases, guilt may also emerge and co-occur with shame (Ferguson et al., 2000; Lewis, 1971; Tangney, Wagner, & Gramzow, 1992).

To assess how shame tethered to traumatic experiences are related to PTSD, the following study utilised a multidimensional trauma specific shame measure, *The Trauma-Related Shame Inventory* (Øktedalen et al., 2014). The study also assessed whether shame is simply a correlate of PTSD or if it contributes to the maintenance of PTSD symptoms over time.

Chapter 3. Study 2: The relationship between shame and PTSD following trauma exposure: A 9-month prospective study

The following chapter has been submitted for publication and is under peer review:

Seah, R., Rogers, K. & Berle, D. The relationship between shame and PTSD following trauma exposure: A 9-month prospective study. *Psychological Trauma: Theory, Research, Practice and Policy.*

(Submitted/Under Review)

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Abstract

Objective: Shame has been identified as a key emotional response following exposure to traumatic events. Theory suggests that shame exacerbates the course of posttraumatic stress disorder (PTSD), but the evidence supporting the temporal co-occurrence of this relationship is limited. This study investigates the prospective relationship between shame and PTSD in a broad trauma exposed sample, along with other key variables such as trauma history and exposure to interpersonal trauma.

Methods: 176 trauma exposed adults ($M = 32.36$ years, $SD = 10.86$) completed a range of self-report measures assessing trauma history, shame, and PTSD symptoms on four occasions across 9 months. The association between shame and PTSD over time was assessed using Linear Mixed Models (LMM).

Results: Shame had a significant positive association with PTSD over time ($B = .25$, $p = .04$, 95% CI [0.10 to 0.49]). Cumulative trauma exposure was also positively associated with PTSD symptom severity across time.

Conclusions: Both cumulative trauma exposure and shame associated with traumatic events can persist many years post trauma and may serve to maintain PTSD long after the index trauma experience.

Keywords: Shame, PTSD, posttraumatic stress disorder, trauma

Introduction

Posttraumatic stress disorder (PTSD) is a highly debilitating psychiatric disorder resulting from exposure to extraordinary stressful and potentially traumatic events (Bromet et al., 2018; Kessler et al., 2017). Hallmark features of PTSD include re-experiencing symptoms, intrusive memories and changes in arousal and reactivity; experiences that typically prompt avoidance of internal and/or external reminders of the traumatic event (American Psychiatric Association [APA], 2022).

Historically, PTSD has been conceptualised as an anxiety-based disorder, with fear-based emotions and appraisals of persistent of ongoing and current threat being the central focus of evidence-based treatments for PTSD (Foa et al., 2006; Foa & Kozak, 1986; Foa & Cahill, 2001). However, recent changes to the Diagnostic Statistical Manual for Psychiatric Disorders (DSM), have expanded the scope and nature of PTSD (APA, 2022), giving way to the recognition that emotions, such as shame, also contribute to the development and course of PTSD (Lanius et al., 2013).

Shame is a self-conscious emotion where the entire self is negatively evaluated and painfully scrutinised. It is typically accompanied by feelings of worthlessness and inadequacy (Lewis, 2000; Lewis, 2003; Tangney & Dearing, 2002; Tracy & Robins, 2006) and fear of negative exposure.

Following exposure to potentially traumatic events (PTEs), trauma survivors will often seek to assign meaning and attribute cause for their trauma. For some, a causal attribution of trauma to them being weak, inadequate or powerless to change their circumstances, leads to an internalised responsibility or self-blame for their experiences (Ehlers & Clark, 2000). These internal attributions can also extend to stable and global aspects of the self, which contribute to feelings of shame (Seah & Berle, 2022; Tracy & Robins, 2006). Shame is also intensified when the event is perceived to be congruent with

pre-existing shame relevant beliefs of the self or when the event violates perceived internal or external standards (Lee et al., 2001; Wilson et al., 2006). Consequently, shame signals a threat to one's identity and potential of rejection and public scrutiny (Lewis, 2000; Lewis, 2003; Tangney & Dearing, 2002; Tracy & Robins, 2006). This prompts behavioural responses such as withdrawal and avoidance that only serves to intensify PTSD symptoms (Leonard et al., 2020).

There is a substantial evidence base indicating an association between shame and PTSD symptoms (Saraiya & Lopez-Castro, 2016). However, relatively few studies have examined the role of shame in maintaining PTSD using prospective designs. Amongst crime survivors, shame was found to be a significant predictor of posttraumatic stress symptoms (PTSS) up to six months posttrauma (Andrews et al., 2000). In a series of studies examining the effects of abuse related shame, Feiring and colleagues (Feiring, Taska, & Chen, 2002; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005) found that higher levels of abuse related shame predicted poorer overall adjustment up to six years and children with lower levels of shame had better treatment prognosis. Shame associated with early experiences could also resurface in adulthood, especially when encountering situations that increase vulnerability to more severe psychopathology. For example, in a recent study by Menke et al. (2018), higher levels of maltreatment-related shame in childhood predicted higher levels of depression and PTSD symptoms among postpartum adult women. Although promising, these existing prospective studies are focused on interpersonal trauma survivors, such as sexual abuse or emotional and verbal maltreatment (Beck et al., 2011; Menke et al., 2018). This limits our ability to generalise results to other trauma exposed populations, making it unclear whether shame is a barrier to recovery in select populations or a prevailing issue within PTSD. This is an important consideration as clinicians need to be mindful that certain risk factors, such as experience of interpersonal trauma and cumulative trauma exposure might

increase not only one's propensity toward shame in general, but also the endorsement of elevated trauma-specific shame, and PTSD symptom severity.

Interpersonal trauma is defined as the direct perpetration of harm from another individual or group to another (Mauritz et al., 2013; Ozer et al., 2003), and associated with increased risk of PTSD (Benjet et al., 2016; Charuvastra & Cloitre, 2007). It is also not uncommon for interpersonal survivors to blame themselves for their traumatic experience (Feiring et al., 1996; Vidal & Petrak, 2007), or engage in negative self-appraisals that generate feelings of unlovability or worthlessness (Herman, 2011; Pattison, 2000), characteristic of shame.

Cumulative trauma exposure is also a well-documented risk factor for PTSD. Multiple TEs are the rule, not the exception (Kessler et al., 2017). Accordingly, a greater number of exposures to adverse events can contribute to a cycle of re-victimisation contributing to more detrimental psychosocial outcomes, increasing the risk of future PTSD. Further, according to Stein et al. (2016), exposure to multiple traumatic events (TE) may also result in a combination of symptoms that fulfil diagnostic criteria for PTSD. Similarly, early experiences that evoke shame can also shape cognitions related to the self, others and the world, increasing psychological distress and vulnerability to future psychopathology (Aakvaag et al., 2016; Babcock & DePrince, 2012; DePrince et al., 2011). Therefore, exposure to multiple TE not only undermines an individual's sense of safety and stability within the world, it potentially reinforces maladaptive self-blame cognitions (e.g., "I am weak", "something is wrong with me") that are pathogenic of shame (Harman & Lee, 2010).

The first aim of the study was to confirm the cross-sectional relationship between shame and PTSD. We also sought to investigate the relationship the aforementioned risk factors and PTSD and compare levels of reported shame amongst individuals who endorse exposure to interpersonal trauma, to those that do not.

To determine whether shame maintains PTSD over time, the second aim was to characterise the magnitude of the relationship between shame and PTSD over time, regardless of the type of trauma exposure and the time since trauma exposure. This is important as it is more reflective of clinical practice, where individuals enter treatment at various points in their life. We could also expect that endorsement of PTSD symptoms is expected to change over the course of one's life. For most people, symptoms generally decline within the first year following a TE without treatment. However, for others, symptoms can persist and follow a chronic course, or there may be a delay in symptom expression that would not be otherwise identified using cross sectional research (Bryant et al., 2016; Bryant et al., 2015; von Stockert et al., 2018).

As noted earlier, symptoms of shame can also fluctuate in intensity following exposure to additional TE, highlighting the importance of assessing shame symptoms beyond immediate trauma exposure (Amstadter & Vernon, 2008; Bryant, Creamer, O'Donnell, et al., 2017). According to Amstadter and Vernon (2008), emotions that are elicited through causal appraisals tend to increase with time posttrauma. However, these authors focused on retrospective endorsement of peri-traumatic (at the time of trauma) emotions and compared this to emotions reported during the assessment, which are subject to memory biases leading to inconsistent recall (Southwick et al., 1997) and mood-state dependent recall (Eich, 1995). Further, the use of two time points makes it difficult to characterise the nature of change.

More recently, Bryant, Creamer, O'Donnell, et al. (2017) demonstrated that non-fear based PTSD symptoms emerged in the chronic posttraumatic phase (12 months from exposure) but not in the acute phase (1-21 days from exposure). Extending this, von Stockert et al. (2018) found that negative emotions as per the new DSM-5 (APA, 2013) symptom clusters were stable over time, despite an average of 26 years since trauma exposure. Combined, these findings suggest that there may be differences in trauma responses and

symptom expression over the course of an individual's life, which has important implications for modifying existing interventions to accommodate these differences.

Based on the existing literature, we expected that shame would have a significant and moderately strong relationship with PTSD. Further, we expected that individuals who endorsed an interpersonal trauma would report higher levels of shame and PTSD. We also expected that there would be a significant association between shame and PTSD symptoms over time. In terms of the magnitude of change, we did not have an a-priori hypothesis, as this was largely exploratory in nature.

Methods

Participants and Procedure

Ethical approval was obtained for the current study from the University of Technology Sydney (HREC Number 216328). Participants were recruited from Australia, Canada, Ireland, The United Kingdom and The United States via Prolific Academic (ProA), an online crowdsourcing platform for research participants. Participants were included in the study if they were: 1) $\geq$ 18 years old, 2) endorsed exposure to at least one potentially traumatic event (PTE) within their lifetime according to the Life Events Checklist (LEC) (Weathers, Blake, et al., 2013b). Participants who consented to participate were administered a battery of self-report measures on four occasions across 9-months, at 3-month intervals. Participants were compensated at a rate of 5GBP per hour for study completion at each time point.

Two hundred and thirteen participants consented to the study, however 37 withdrew before completing baseline assessments. The final sample consisted of 176 participants ($M = 32.36$ years, $SD = 10.86$) who completed all baseline measures. Of these, 106 (60.23%) completed the second follow-up assessment, just over half ($n = 99$; 56.63%) completed the

third follow-up, and just under half of participants (*n* = 82; 46.59%) completed the final

follow-up assessment at 9-months.

Self-Report Measures

The Lifetime Events Checklist (LEC)

Trauma history was assessed using the LEC (Weathers, Blake, et al., 2013b). The

LEC is a 17-item self-report measure, which screens for exposure to potentially traumatic

events (PTE) in a respondent's lifetime. It consists of 16 event categories and an additional

item assessing for any stressful life event not listed. The trauma endorsed as currently most

distressing was used as the reference trauma which was tethered to trauma-related shame and

PTSD symptoms. Details related to the reference trauma such as time since the worst trauma,

the nature of the traumatic event, were also obtained. Interpersonal trauma, defined as human

inflicted trauma (e.g., physical assault; Ozer et al., 2013) was coded as 1 and non-

interpersonal trauma that did not involve human perpetration (e.g., natural disasters) were

coded as 0. The reference trauma was independently coded based of qualitative descriptions

of participants' worst reported, index trauma, on the LEC (Weathers, Blake, et al., 2013b), by

the first and last author.

There was almost prefect agreement between the authors, in the classification of

interpersonal trauma, κ = .907, *p* < .001. The remaining cases were discussed in view of the

current literature, until a consensus was reached on the categorisation of each reference

trauma.

A total lifetime trauma history or trauma exposure was also obtained by summing the

number of traumatic event categories endorsed by the individual. The LEC has demonstrated

good temporal stability and convergent validity (Gray et al., 2004).

The PTSD Checklist for DSM-5 (PCL-5)

The PCL-5 (Weathers, Litz, et al., 2013) is a 20-item measure used to monitor symptom change and screen individuals for probable PTSD. Participants endorse the extent to which they were bothered by PTSD symptoms in relation to their reference trauma over the past month on a 5-point Likert scale ranging from 0 (*not at all)* to 4 (*Extremely*). A total PTSD symptom severity score between 0 to 80 is obtained by summing each item, with scores $\geq$ 31-33 indicative of a probable PTSD diagnosis (Bovin et al., 2016). The PCL-5 has strong reliability and validity and is a psychometrically sound instrument for quantifying PTSD symptoms (Bovin et al., 2016).

The Trauma Related Shame Inventory (TRSI)

The TRSI is a 24-item measure of trauma-related shame (Øktedalen et al., 2014). Respondents rate the extent to which they experience shame related thoughts and feelings (e.g., "As a result of my traumatic experience, I find myself less desirable") in relation to their endorsed reference trauma over the past week on a 5-point Likert scale 0 (*Not true of me*) to 4 (*Completely true of me*). The TRSI consists of two scales: Internal shame and External shame. The internal scale reflects inner experiences of shame (e.g., "As a result of my traumatic experience, I have lost respect for myself") and the external scale reflects perceptions of others (e.g., "If others knew what happened to me, they would view me as inferior"). Both the internal and external shame scale can be summed to yield a total Trauma-Related Shame score. In the current study, the total Trauma-Related Shame score was used. The TRSI has demonstrated strong content and construct validity (Øktedalen et al., 2014), and discriminate validity from the Trauma Related Guilt Inventory (Kubany et al., 1996).

Additional Measures

For our preliminary cross-sectional correlational analyses, we administered the Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002), to assess for the presence and severity of depression symptoms, the Generalised Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) to screen for the presence of GAD symptoms, and the Trauma related Guilt Inventory (TRGI; Kubany et al., 1996) to assess trauma related guilt. These have all been subject to detailed psychometric validation and so are not further summarised here.

Statistical Analyses

Statistical analyses were conducted using Statistical Package for the Social Sciences (SPSS) Version 29. Spearman rank correlations were calculated given the non-normal positively skewed distributions of shame and PTSD. To assess whether participants who endorsed exposure to an interpersonal trauma would report higher levels of shame and PTSD symptom severity at the baseline assessment, Mann-Whitney U tests were conducted, with shame and PTSD symptom severity as outcome variables (Field, 2000).

Missing Data

Missingness ranged from 40.3% at T2 to 63.1% at T4. Shame had the highest missingness at T4. 29.89% of participants completed all follow-ups. Data was assumed to be Missing at Random (MAR) (Bhaskaran & Smeeth, 2014). Sixty imputed datasets were generated using Multiple Imputation by Chained Equations (MICE; Azur et al., 2011), with predictive mean matching for continuous variables, by randomly selecting a complete case from the closest five predictions, with fully conditional specification. Scores for TRSI, GAD-7, PHQ-9 and PCL-5 were included in the Multiple Imputation model. Regression models

were run on each imputed dataset, and the results were combined using Rubin's rule (Rubin, 2004).

Linear Mixed Models

A linear mixed model (LMM) was used to estimate the relationship between shame and PTSD symptoms across time. Analysis was conducted using the multiple imputed datasets. PTSD symptoms was the dependent variable, and covariates included years since reference trauma, trauma history, participants' trauma type (interpersonal versus non-interpersonal), gender, and time of assessment (3, 6, 9-months) as categorical covariates. An interaction effect between shame and time was also assessed.

The Trauma-Related Shame (TRSI) variable from the preceding timepoint was created as a lagged covariate (e.g., from the previous assessment) to assess shame as a dynamic factor. Covariance structure was assessed using the Schwarz's Bayesian Criterion (BIC; Gideon, 1978) on the first imputed dataset, and a Unstructured (UR) covariance structure was selected as it had the lowest BIC value. According to both histograms and scatterplots, the distribution of residuals was normal and there was no linear pattern or association between the residuals and covariates.

Results

Participants

See Table 1 for baseline demographics. Just under half of participants ($n = 84$; 47.72%) scored within the clinical range of PTSD, indicating a probable current diagnosis of PTSD. Participants reported exposure to an average of 8.70 ($SD = 4.37$) categories of trauma across their lifetime. The most common trauma exposure types were transport accident ($n =$

146; 83.0%; physical assault (n = 132; 75.0%) and life-threatening illness and injury (n =

127; 72.3%). See Table 1 in <u>Supplementary Material</u> for a summary of trauma exposure.

The average time since participants' worst reported trauma, classified as the event that

currently bothers and/or impacts them the most, was 11.30 (SD = 11.0) years from the date of

baseline assessment. More than half of participants reported direct exposure to their reference

trauma (n = 115; 65.34%). Fifty-six (31.82%) participants reported experiencing a similar

traumatic event at least more than once (M = 3.07, SD = 2.35), and 27 (15.34%) participants

reported exposure to their reference trauma more than once. Seventy-three (41.48%)

participants endorsed some form direct exposure to interpersonal trauma as their worst

trauma exposure, reporting higher levels of shame (Mdn = 108.79, U = 2,278, p < .001), and

PTSD symptoms (Mdn = 102.46, U = 2,740, p = .002), compared to those that endorsed a

non-interpersonal trauma event (Mdn = 74.12 and Mdn = 78.61, respectively).

Table 1

Characteristics of Participants at Baseline[a]

Baseline Characteristic	n (%)
Gender	
Male	66 (37.50%)
Female	107 (60.80%)
Prefer to self-describe	3 (1.70%)
Ethnicity	
White	138 (78.41%)
Asian (East, South)	12 (6.82%)

Middle Eastern	2 (1.14%)
Hispanic	4 (2.27%)
Other[b]	20 (11.36%)
Marital Status	
Single	59 (33.52%)
Defacto relationship/Married	115 (65.34%)
Separated/Divorced	2 (1.14%)
Employment Status	
Not engaged in paid work/seeking employment	47 (26.14%)
Casual/Part time employment	42 (23.86%)
Full time employment	87 (49.43%)
Current Mental Health Diagnosis	61 (34.66%)
Past Mental Health Treatment[c]	102 (57.95%)
Current Mental Health Treatment[d]	
Psychologist	13 (7.39%)
Psychiatrist	8 (4.55%)
Counsellor	13 (7.39%)
Psychotherapist	3 (1.70%)
Current Psychiatric Medication	40 (22.73%)

Note. $N = 176$.

[a]Numbers reflect percentages out of full sample. All percentages are reported using the standard scientific rounding, and do not add up to 100 percent. [b]Majority of participants' self-reported ethnicity/race in this category were African American or mixed. [c]Of the participants

who reported engaging in past mental health treatment with at least one health practitioner, 67 (38.07%) from were from a counsellor, 61 (34.66%) from a general health practitioner, 31 (17.61%) from a psychologist, 28 (15.91%) from a psychiatrist, and 9 (5.11%) from a psychotherapist. [d]Not independent; participants could endorse more than one mental health treating professional.

Descriptive Statistics and Correlations

Just under half (47.73%) of participants currently met the diagnostic threshold for probable PTSD (PCL scores $\geq$ 31; Weathers, Litz, et al., 2013). Trauma-related shame and depression symptoms both had moderately strong associations with PTSD symptoms (r_s = .68). Both type of trauma and cumulative exposure had small to moderately strong associations with PTSD symptoms (r_s = .23 and r_s = .28, respectively). Table 2 in Supplementary Material summarises the key descriptive statistics and correlations between key variables at baseline.

Association of Shame with PTSD Symptoms Over Time

See Table 2 for estimated fixed effects for the LMM across 9-months. Across time, shame had a significant positive association with PTSD (B = 0.28, p = .00, 95% CI [0.10 to 0.48]). Higher levels of trauma exposure were also associated with more severe PTSD symptoms across time (B = 0.47, p = 0.02, 95% CI [0.06 to 0.88]). Reference trauma type and years since reference trauma were unrelated to PTSD symptoms across time. There was not a significant interaction effect between shame and time. The findings indicate that with every 1-point increase in shame, PTSD symptoms on the PCL-5 are expected to increase by 0.25. The estimated marginal means for PTSD were 27.83 at 3 months, 26.47 at 6 months, and 26.86 at 9 months, indicating little change in PTSD scores over the 9-month period.

Table 2

Linear Mixed Models of Changes in PTSD Symptom Scores Across 9 Months

	B	SE	*p*	95% CI
Shame	0.25	.12	.04	0.10 to 0.49
Shame*3 months	.15	.11	.19	-0.07 to 0.36
Shame*6 months	-.04	.13	.76	-0.29 to 0.21
Type	4.37	2.74	.11	-1.01 to 9.74
Gender	-2.13	2.24	.34	-6.53 to 2.27
Exposure	0.47	0.21	.03	0.05 to 0.88
Years	0.01	0.13	.96	-0.24 to 0.25
3 months	0.97	1.68	.56	-2.33 to 4.27
6 months	-0.39	2.45	.87	-5.23 to 4.45
9 months[a]	0			

[a]Timepoint 4 (9 months) was set as the reference group.

Note. Shame = TRSI total score; Type = Reference trauma type, interpersonal (1) v non interpersonal (0); Gender = male (1), female (2), prefer to self-describe (3), Exposure = Trauma load; Years = Time since reference trauma. When guilt was included in the model, the results remained the same.

Discussion

The purpose of our study was twofold. Firstly, we aimed to investigate the relationship between shame and PTSD in a broad trauma exposed cohort. We also investigated whether individuals who were exposed to interpersonal trauma endorsed higher levels of shame and more severe PTSS. Findings indicated that shame had a moderately strong relationship with PTSD symptoms. As expected, individuals who endorsed an interpersonal trauma as their

reference trauma also reported elevated levels of shame and PTSS (La Bash & Papa, 2014; Seah & Berle, 2023).

Secondly, we sought to investigate whether shame is associated with PTSD regardless of time since trauma exposure, and when controlling for the role of trauma type and cumulative trauma exposure. We also sought to characterise the magnitude of this prospective relationship.

Consistent with predictions, shame was associated with PTSD symptoms throughout the 9-month duration of our study. With respect to the magnitude of change, higher levels of shame only demonstrated a weak association with PTSD symptoms across time. Findings also indicate that shame remains relatively stable over time. This is consistent with von Stockert et al. (2018) who found that negative emotions were stable over time, despite an average of 26 years since trauma exposure. However, the strength of association was much smaller compared to previous prospective research indicating moderately strong associations between shame and PTSD (Alix et al., 2020; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005). Nevertheless, it is worth noting that these studies focused on sexual abuse survivors. As noted earlier, it is likely that the experience of shame is likely to be more enduring and pathogenic in these populations. Further, these studies focused on treatment seeking populations, that present more closely to the time of trauma exposure, where one could expect symptoms to be more elevated.

Given the magnitude of change, our findings suggest that any trauma-related shame intervention would require substantial reductions in shame before we could expect meaningful changes in PTSD symptoms. This is unsurprising as PTSD is a heterogenous disorder and various psychosocial factors contribute its presentation (Bryant et al., 2022; Campbell-Sills et al., 2021). In our investigation, we also considered the influence of cumulative TE, trauma type in relation to shame and PTSD. Consistent with theory and

previous empirical findings (Amstadter & Vernon, 2008; Herman, 2011; La Bash & Papa, 2014) individuals who endorsed some form of interpersonal trauma as their reference trauma reported higher levels of shame and PTSD symptoms. Similarly, cumulative TE was also significantly associated with PTSD symptoms. However, the magnitude of the relationships between both risk factors with shame and PTSD symptoms, were weak. Nevertheless, clinicians should be mindful and assess not only for index trauma related to current symptoms but also consider the effects of cumulative traumatic stressors and how it impacts current clinical presentations.

Interestingly, endorsement of an interpersonal traumatic event as one's worst trauma was not significantly related to PTSD scores over time. In the current study, we attempted to categorise trauma types based on qualitative descriptions of participants' reference trauma. Even though the simple score sum was assumed to be a useful proxy for interpersonal trauma exposure, it does not consider that some interpersonal traumatic events are more personally salient and psychologically deleterious than others. Further, not all interpersonal traumas are comparable. Previous studies that examined shame and PTSD symptoms, have largely focused on sexual assault survivors (Feiring, Taska, & Chen, 2002; Sippel & Marshall, 2011; Street & Arias, 2001). Arguably, these events are phenomenologically distinct from other interpersonal traumatic events such as robbery or a single incident of physical assault, which may not necessarily elicit shame. Thus, an assessment of not only the type of trauma event, but the nature of the event and type of exposure (direct, indirect, cumulative) is warranted.

Overall, our findings suggest that for trauma exposed populations, PTSD symptoms tend to be stable and persistent across 9-months. Although PTSD scores were typically slightly below the clinical threshold for probable PTSD, they were still elevated to the extent that they could cause significant functional impairment (Larsen, Bellmore, et al., 2019; Marshall et al., 2001; Zlotnick et al., 2002). The pattern of PTSD scores is consistent with

suggestions that PTSD scores tend to be both relatively chronic and stable over time (Kessler et al., 1995; McFarlane, 2000; Perkonigg et al., 2005), and in some cases, as time elapses, more difficult to treat (Wang et al., 2007).

Several limitations of the current study are noted. Firstly, the timeframe of assessment was relatively short, which limits extrapolation. Thus, extensions are warranted to assess changes over longer intervals. Second, although we aimed to recruit a broad trauma exposed population, the sample is restricted to participants familiar with the Prolific Academic platform, which limits generalisability to non-users. Further, more than half of participants were previously engaged with some form of psychological support. Although it is unclear whether they sought support for their trauma directly, it is possible that their PTSD symptoms were partially resolved by, or indirectly responded to treatment.

Second, although the PCL-5 is a well validated measure of PTSD symptoms, if time permits, the use of clinician rated diagnostic interviews, such as the Clinician-Administered PTSD Scale for DSM-5 (CAPS5) (Weathers, Blake, et al., 2013a) is preferable, due to limitations associated with self-report measures (Sellbom et al., 2018). Third, although sample attrition is common and inevitable in longitudinal studies, there was an unfortunately high attrition rate. Although Multiple Imputation was used to mitigate the effects of missing data, it is possible potential biases remained.

Finally, although the study aimed to recruit a broad trauma exposed sample, it is possible that it was biased toward a population with psychosocial protective factors. For instance, a large proportion of participants were engaged in some form of paid employment, and over half endorsed being married or a de-facto relationship. This limits the generalisability to potentially more vulnerable trauma exposed populations. In any case, a high proportion of individuals were nonetheless reporting PTSD symptoms in the clinical range. As noted, this could still contribute to levels of distress and impairment that is

comparable to treatment seeking populations. However, replication with broader trauma exposed samples in both the general population and within treatment seeking populations is needed to substantiate this.

Despite the limitations, the strengths of the current study should be acknowledged. To our knowledge, this is the first prospective study that has examined the longitudinal relationships between shame and PTSD in a broad trauma exposed cohort. The study also included participants with varying trauma histories that occurred at various point in their lifespans, which represents typical clients seen in clinical practice. Further, it extends previous work from single incident trauma types and provides important findings from a sample comprised of a wide range of interpersonal and non-interpersonal trauma survivors.

Conclusion

Results of our study indicate that the prospective relationship between shame and PTSD symptoms remains evident many years after a person's index trauma, highlighting the persisting and pathological long-term correlates of trauma-related shame. This suggests that the presence of trauma-related shame may indicate an unfavourable long-term prognosis for one's PTSD symptoms, especially if, it serves to perpetuate or maintain PTSD symptoms many years, post trauma. It is recommended that shame is not only assessed at the start of treatment, but continuously throughout the course of treatment with additional follow-up to examine and model the various putative trajectories of shame and PTSD severity across time.

Prelude to Chapter 4

Findings from Study 1 (Chapter 2) and Study 2 (Chapter 3) provided confirmation that shame is not only related to PTSS but maintains symptoms over time. The next step in this program of research is to investigate how and why shame emerges post trauma.

As noted in Chapter 1, maladaptive appraisals are responsible for the development and maintenance of PTSD symptoms (Dunmore et al., 2001; Ehlers & Clark, 2000; Ehring et al., 2008; Foa et al., 1999; Halligan et al., 2003; LoSavio et al., 2017). Accordingly, for shame to emerge, individuals must first attribute the precipitating event to internal, stable, and global causes – a fundamental cognitive antecedent to shame. Studies 3-5 aimed to investigate the relationship between causal attributions, shame, and PTSD.

To our knowledge, there has not been a qualitative or quantitative synthesis of the existing findings linking attributions to shame and PTSD (classified according to the DSM-5 (APA, 2013) and/or DSM-5-TR (APA, 2022)). Study 3 sought to fill this gap by systematically reviewing peer review articles published between 1980 to 2022.

Chapter 4. Study 3: Was it me? The role of attributions and shame in posttraumatic stress disorder (PTSD): A systematic review

The following chapter has been accepted for publication:

Seah, R., Dwyer, K., & Berle, D. Was it me? The role of attributions and shame in posttraumatic stress disorder (PTSD): A systematic review. *Trends in Psychology* (Accepted)

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Abstract

Shame has been identified as a key emotional response to trauma exposure and is implicated in the development and maintenance of PTSD. Despite this, there is a lack of empirical research explaining how and why shame emerges following trauma exposure. Current theoretical models of shame converge on the idea that shame is elicited through internal, stable, and global attributions about the precipitating event.

A systematic review was conducted to assess the relationship between causal attributions, shame, and PTSD symptomology. A database search of PsycINFO, PubMED, Medline, EMBASE and PTSDPubs identified articles published between 1980 to 2022 that enabled examination of the relationship between attributions, shame, and PTSD. A total of eight articles met inclusion criteria for this review.

There were cross-sectional relationships between internal attributions, shame, and PTSD symptoms, with shame demonstrating the strongest relationship with PTSD symptoms. Significant indirect effects were found between internal attributions, shame, and PTSD. Concerns surrounding reliability of measurements and sampling bias making it difficult to draw definitive conclusions. The current evidence is too preliminary to offer strong support for the mediation hypothesis. However, it does offer important avenues for future research that will have important clinical applications.

Keywords: Shame, posttraumatic stress disorder, attributions; appraisals, trauma

Introduction

Posttraumatic Stress Disorder (PTSD) is one of the most common psychological sequelae following the direct witnessing or experiencing of a traumatic event (American Psychiatric Association [APA], 2013). It consists of a set of cognitive, emotional, and physiological symptoms including recurring, intrusive re-experiencing traumatic memories that are involuntary triggered by trauma related cues.

Historically, PTSD has been conceptualised primarily as an anxiety, fear-based disorder (see North et al., 2016 for a discussion on the evolution of PTSD diagnostic criterion) that has been thought to arise from a failure to emotionally process the traumatic event due to maladaptive and excessive fear associations with the traumatic memory (Foa & Kozak, 1986). Over time, these symptoms lead to an increased hypersensitivity to threat (Ehlers et al., 2004; Ehlers et al., 2002), and physiological hyperarousal that promotes cognitive and behavioural avoidance.

More recently, there have been suggestions that addressing fear alone using exposure based therapies may not be sufficient in resolving PTSD symptoms altogether, with up to 50% of patients with PTSD remaining symptomatic post treatment (Bradley et al., 2005). Left untreated, PTSD runs a chronic course, with significant psychiatric comorbidity and increased suicide risk (Kessler, 2000), underscoring the need to improve existing treatment models. In response, researchers have begun implicating other potentially dysregulated emotions, such as shame as a possible contributor to PTSD (Lee et al., 2001; Lopez-Castro et al., 2019; Taylor, 2015; Wilson et al., 2006). Beyond exposure-based therapies, other evidenced approaches have emerged to address additional diagnostic features of PTSD. For example, Cognitive Processing Therapy (CPT) (Resick et al., 2016; Resick & Schnicke, 1992) focuses on cognitive behavioural principles, and includes a greater focus on processing

and challenging appraisals related to shame. Although promising, outcome studies examining shame's response to treatment are only just emerging (e.g., Resick et al., 2008).

Trauma related shame has been associated with intrusive recollections, hyperarousal, and avoidance (Dewey et al., 2014; Dorahy et al., 2013; Sippel & Marshall, 2011). Immediate reactions of shame following a traumatic event have also been found to mediate the relationship between trauma exposure, and posttraumatic stress symptoms (PTSS) up to six months post trauma (Andrews et al., 2000; Beck et al., 2011). Despite converging evidence demonstrating significant associations between shame and PTSD (Lopez-Castro et al., 2019), the mechanisms that could account for therapeutic change are still unclear. Thus, future research explicating how and why shame is elicited following a trauma, is still needed.

Shame is conceptualised as a self-conscious emotion as it relates to our perceptions of ourselves; a painful, negative self-evaluative emotion that prompts negative self-judgement (Tracy et al., 2007). It is considered a cognitively complex emotion as it arises through a series of cognitive appraisals. In particular, for shame to arise, an individual first has to make an individual makes an internal attribution pertaining to the cause of the eliciting event (Tangney & Dearing, 2002; Tracy et al., 2007). Although it is often used synonymously with guilt, both have distinct phenomenological experiences. Shame is thought to arise through a global negative evaluation of the self, where the individual fails to meet a perceived internal or external standard. Subsequently, the self is viewed as flawed, inadequate, or even worthless (e.g., "I am bad"). (Lewis, 1971; Lewis, 2003; Tangney & Dearing, 2002). Sources of shame might originate through negative schematic representations of the self (Lee et al., 2001), or externally through stigmatisation and/or public condemnation (Gilbert, 1997). Guilt relates to a specific focus pertaining to one's behaviour (e.g., "I did a bad thing"). This distinction is important as both affective experiences prompt divergent responses. Guilt tends

to elicit prosocial behaviour, whilst the experience of shame, tends to motivate withdrawal due to the desire to hide oneself.

Current theoretical models of shame (Lazarus, 1991; Lewis, 1971; Tangney & Dearing, 2002; Tangney et al., 2007; Tracy et al., 2007) converge on the idea that beyond the causal locus, two additional attribution dimensions are critical to the elicitation of self-conscious emotions. Specifically, causal dimensions regarding the globality, or generality and the stability or permanence. The model holds that after an internal attribution is made, the individual evaluates whether the cause pertains to them, and whether this is likely to change. Shame is said to arise through internal, stable, and global attributions, such as one's personality or character. In contrast, guilt, is purported to arise through internal, unstable, and specific attributions, such as one's behaviour.

It stands to reason that following a potentially traumatic event, individuals may be inclined to attribute blame to themselves or others. This assumption is consistent with the cognitive model of PTSD (Ehlers & Clark, 2000), which holds that negative appraisals of the trauma and its sequalae is a key maintaining factor that leads to a sense of serious, and current threat. In particular, it implicates erroneous causal attributions of one's trauma to the self; self-blame, as one of the key cognitions predictive of PTSD symptoms (Foa et al., 1999). However, findings demonstrating the link between self-blame and PTSD are mixed (Gómez de La Cuesta et al., 2019), with suggestions that self-blame may be a self-protective cognition against PTSD (Nickerson et al., 2013). Possible explanations for this discrepancy include the methodological limitations associated with current measures of trauma-attributions in the context of PTSD.

The examination of the cognitive antecedents of shame provides an opportunity for future research to inform current or new treatments for shame. To do so, an important first

step is to better understand the current research linking attributions, shame, and PTSD and to establish an empirical foundation.

The current paper aims to provide a comprehensive review of the literature regarding the relationship between attributions, shame, and PTSD. As shame and attributions can be considered both states and/or traits, the review will refer to these constructs interchangeably. Specifically, it aims to synthesise and evaluate the research evidence pertaining to this association. Due to the specificity of the research question, and the possibility that few studies will be included, studies that reported on both children and adults will be included. Both child, adolescent and adult studies will be examined separately to identify potentially distinct or similar associations between target variables within these populations. A discussion of the key findings from each study will also be included along with recommendations for future research and the implications for clinical practice.

Method

Search Strategy and Selection Review

This review protocol was registered with PROSPERO, the internal prospective register of systematic reviews (Registration number: CRD42020148804). The review process was followed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).

Electronic searches were conducted of the following databases: PsycINFO, PubMed, Medline, EMBASE, and PTSDPubs (formally known as PILOTS). The search was carried out between 26 August 2019 and 3 October 2019, updated on 25 November 2022. The following search terms were identified in the title, abstract, keywords and MeSH terms for shame: (*shame**) in combination with PTSD, PTSS (Posttraumatic stress symptoms) and related terms (*post traumatic stress disorder OR post traumatic stress symptoms OR post*

traumatic stress reactions OR trauma* OR Psychotrauma OR psychol* trauma*) and trauma related attributions (*causal attribution* OR trauma attribution* OR self-blame OR attribution* OR cognitive appraisal* OR appraisal**). All databases were searched from 1980 (when PTSD was formally introduced into the Diagnostic and Statistical Manual of Mental Disorders (DSM)) to 2022. Reference lists of included studies were manually screened for additional relevant papers. All references were managed using Endnote. Duplicates were removed iteratively using Endnote's duplication identification tool, then manually.

Inclusion and Exclusion Criteria

Articles were identified using the following inclusion criteria: empirical peer reviewed journal articles, written in English, which included:

1. Child, adolescent, and adult samples.

2. A quantitative measure of PTSD symptoms, either through a semi structured interview or self-report questionnaire.

3. A quantitative measure of shame, attribution style and/or trauma-related causal attributions.

Articles were excluded from the review based on the following criteria:

1. Studies not published in English and without English translation.

2. Articles without empirical data such as qualitative studies and/or review papers.

3. Categorical, single-item measures of any of the target variables, as they have indeterminant reliability (Wanous & Reichers, 1996). Further, single item measures are not appropriate to assess PTSD symptom severity.

4. Studies that do not contain all target variables (attributions, shame, and PTSD).

5. Studies that involved treatments either through routine clinical interventions and/or Randomised Controlled Trials (RCTs) that could influence participants' attributions, shame and/or PTSD symptoms.

Study Selection and Quality Assessment

The first and second author independently screened both abstracts and full texts according to the inclusion and exclusion criteria. There was almost perfect agreement between the two reviewers, $\kappa = .928$ (95% CI, .879 to .977), $p < .05$. A total of 734 records (excluding duplicates) were identified. After screening of abstracts and titles, 77 articles were identified for full text review. More than half ($N = 48$) were excluded on the basis that they did contain measures of all the target variables. Twelve papers were identified as meeting the inclusion criteria. However, four studies (Feiring et al., 2001; Feiring, Taska, & Chen, 2002; Feiring et al., 1998; Feiring & Taska, 2005) were excluded on the basis that they consisted of participants from the same recruitment sample (Feiring et al., 1998). To preserve the integrity of the current review, only Feiring, Taska and Lewis (2002) included as it explicitly investigated the relationship between the target variables. Eight studies (three child/adolescent, five adult) were included that met full eligibility criteria (Alix et al., 2020; Alix et al., 2017; Bhuptani & Messman, 2021; Carretta & Szymanski, 2020; Feiring, Taska, & Lewis, 2002; Uji et al., 2007; Wojcik et al., 2022; Zerach & Levi-Belz, 2018).

Methodological Quality

The papers were evaluated for methodological quality using The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross Sectional Studies and Cohort Studies (Joanna Briggs Institute, 2020; Porritt et al., 2014). Both checklists consist of eight and eleven questions, respectively. Each question is answered through four options Yes (Y), No (N), Unclear (U) and Not Applicable (NA). The risk of bias percentage is calculated

based on the number of "Y" selected. Items where "N/A" was selection are not considered in the calculation. Studies with between 0-49% of "yes" responses are considered as being low quality, between 50-69% as moderate quality, 70-100% (Buckingham et al., 2021; Goplen et al., 2019).

Results

Overview of Studies

Figure 1 depicts a summary of the search and screening process, reasons for exclusion. Eight papers in the review originated from the United States, Japan, Israel, and Canada. Sample sizes across participants ranged from 98 to 367. Half of the studies recruited treatment seeking samples from specialist clinics for sexual assault (Alix et al., 2020; Alix et al., 2017; Feiring, Taska, & Lewis, 2002; Wojcik et al., 2022). Two were from outpatient community samples from universities (Bhuptani & Messman, 2021; Uji et al., 2007), one from an online convenience sample of women (Carretta & Szymanski, 2020), and another from a sample of Israeli veterans (Zerach & Levi-Belz, 2018). Table 1 presents a summary of studies included in the review.

Figure 1

PRISMA Flowchart of Article Identification and Final Text
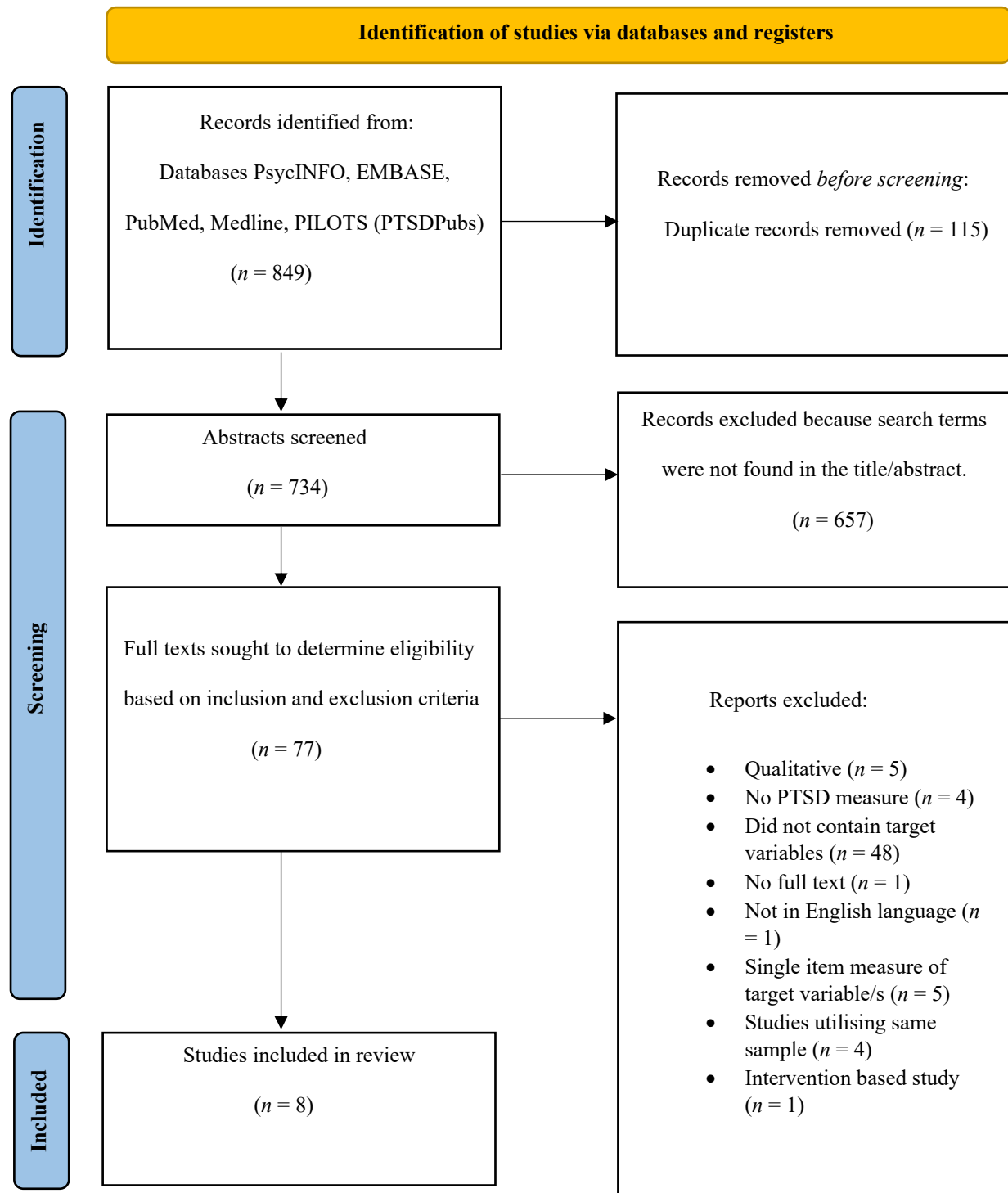
Quality Appraisal

Included articles were assessed for methodological quality. Cross-sectional and prospective studies were appraised separately. See [Supplementary Material](#) Table 1 and 2 for more information. Out of the six cross-sectional studies, four were determined to be high quality, one of moderate quality as they lacked appropriate statistical methods or design to identify or control for confounding factors. The study that was rated low quality lacked the same and did not adequately describe the inclusion and exclusion criteria for their sample. Results were inconsistently reported, which included non-reporting of confidence intervals (du Prel et al., 2009), and inconsistent use of standardised and non-standardised regression coefficients. Further, it was unclear how confounds were addressed statistically. Among the two prospective studies, similar issues were noted, with one study rated as high and another as moderate quality. It is worth noting that both prospective studies (Alix et al., 2020; Feiring, Taska & Lewis, 2002) recruited participants from specialist services, and it was unclear whether participants were receiving any form of intervention or treatment between baseline assessment and follow-up.

Measurement of Trauma and PTSD

Almost all of the studies in the review utilised clinical analogues, as they did not utilise a gold standard assessment of PTSD (e.g., Clinician-Administered PTSD Scale for DSM-5; CAPS-5) (Weathers, Blake, et al., 2013a) to establish a DSM-5 PTSD diagnosis. All studies used developmentally appropriate, self-report measures of PTSD symptoms according to either the DSM-4-TR (APA, 2000) and/or DSM-5 (APA, 2013) criteria for PTSD. This included the Child Impact of Traumatic Events Scale (CITES) (Wolfe, 2002) and the Impact of Events Scale Revised (IES-R) (Weiss & Marmar, 1997) for children and adolescents, and the PTSD Checklist-5 (PCL-5) (Weathers, Litz, et al., 2013) for adults. All of these are validated measures with good reliability/consistency.

In terms of trauma exposure, almost all studies ($n = 7$) used some form of validated or study specific checklist (e.g., Feiring, Taska & Lewis, 2002; Uji et al., 2007) assess for the trauma exposure of interest. None of the studies assessed for broad trauma history.

Measurement of Attributions

For trauma related attributions, the use of abuse specific attribution measures along with individual attributional styles, that is the tendency to attribute negative events to oneself, were used. The Abuse Attributions Inventory (AAI), which measured Abuse-specific internal attributions style was developed by Feiring, Taska and Lewis (2002) which includes items that describe internal and external attributions for abuse. It was subsequently utilised in the other three studies (Alix et al., 2020; Alix et al., 2017; Uji et al., 2007) as a proxy for abuse specific attributions.

Feiring, Taska and Lewis (2002) also assessed for general attributional style using the Children's Attributional Style Questionnaire – Revised (CASQ-R) (Thompson et al., 1998). This measure consists of 24 hypothetical events with half describing a positive outcome and the other, a negative outcome. Each event has two possible attributions and respondents are asked to pick why each event occurred. Each description relates to one of the three attributional dimensions (internal, stable, and global). A pessimistic attribution style was calculated as the difference between attributions for negative events and positive events; a lower score indicated a tendency to attribute events to internal, stable, and global causes for both positive and negative events. Conversely, Zerach and Levi-Belz (2018) utilised the Depressive Attributions Questionnaire (DAQ) (Kleim et al., 2011) to examine internal attributional styles based on the Hopelessness and Learned Helplessness model of depression (Abramson et al., 1978; Seligman et al., 1979), and the Cognitive Model of depression (Beck et al., 1979). In their study, they refer to this as Depressive Attributions.

Measurement of Shame

Five studies utilised an abuse specific shame measure that was originally designed for the study by Feiring and colleagues (Feiring et al., 2001; Feiring, Taska, & Chen, 2002; Feiring et al., 1998; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005). The remaining adult studies utilised a broad trauma specific measure, The Trauma-Related Shame Inventory (TRSI) (Øktedalen et al., 2014) which assesses shame tethered to the trauma of interest. It also distinguishes internal and external sources of trauma-related shame (Gilbert, 1997).

Bhuptani and Messman (2021) also assessed different types of shame; trait and general shame along with trauma-specific shame, or rape related shame. State shame (general shame) referred to the general feelings of shame, whilst trait shame (shame proneness) was assessed as the propensity for one to experience shame across a range of scenarios that typically evoke personal transgressions. General shame was assessed as experiences of experiential, cognitive and behavioural components of shame in the past year. Shame proneness was evaluated as the propensity to examine guilt and shame across a range of hypothetical personal transgressions. The study utilised the shame negative evaluations scale which focuses on evaluations characteristic of shame (e.g., "I am a bad person", "I am incompetent"; Tangney & Dearing, 2002).

Table 1

Summary of Studies and Key Measures

First author, year and country	Participants	Sample and setting Trauma type	Measures			
	N = sample size M = Mean age SD = Standard Deviation		Attributions	Shame	Trauma	PTSD
Alix et al. (2017) Canada	N = 147 F Age = 14-18 M = 15.51 SD = –	Community sample of adolescents recruited through four child sexual abuse intervention centres in Montreal, Canada Sexual abuse	AAI	ASSQ	HVF	CITES-II
Alix et al. (2020) Canada	N = 100 F Community sample of adolescents from several CSA intervention centres in Montreal, Canada Age = 14-18 M and SD = –	Community sample of adolescents recruited through four child sexual abuse intervention centres in Montreal, Canada Sexual abuse	AAI	ASSQ	HVF	CITES-II
Feiring, Taska & Lewis (2002)	N = 147 n = 83 (Age 8-11) F = 61	Community sample of children and adolescents recruited from various child protection services and	AAI and CASQ-R	AASQ	Study checklist	CITES

United States	M = 22 n = 64 (Age 12-15) F = 47 M = 17 M and SD = –	regional child sexual abuse medical clinics Child sexual abuse				
Bhuptani et al. (2021) United States	N = 229 Ages = – M = 18.88 SD = .94	Undergraduate female students recruited from an introductory psychology course at a large Midwestern United States University Rape in adulthood (> age 14)	RAQ	TRSI GASP Shame-NSE ESS	MSES	PCL-5
Carretta et al. (2020) United States	N = 367 Ages = 18-30 M = 24.80 SD = 3.36	Young adult women recruited through Facebook advertising Sexual harassment (e.g., experiences of unwanted sexual comments, gestures, and behaviours by strangers)	CWD-I	ASSQ	SHI	PCL-5
Uji et al. (2007) Japan	N = 160 M and SD = –	Female students at five different Japanese universities who experienced sexual victimisation	AAI-Japanese	AASQ-Japanese	NSE	IES-R
Wojcik et al. (2022) United States	N = 98 M = 14 F = 86 Age = 18-69	Patients in a partial hospitalisation program (pre-treatment) for PTSD in mid-western United States	PTCI-SB	TRSI	CAPS-5[a]	PCL-5

		Type of trauma exposure unclear.				
	M and SD = –					
Zerach et al. (2018)	*N* = 191	Israeli Combat Veterans recruited through active participants in combat veteran websites, communities, academic centres and volunteers.	DAQ	TRSI	CES	PCL-5
	M = 134					
Israel	*F* = 12					
	Age = 18-21					
	M = 25.39	Combat experience				
	SD = 2.37					

[a] Participants in this study were administered the CAPS-5 (Weathers, Blake, et al., 2013a) to assess trauma exposure and confirm an initial PTSD diagnosis.

Note. – Denotes authors did not report this information.

Attributions measures: AAI = The Abuse Attribution Inventory (Feiring, Taska & Lewis, 2002); AAI-Japanese = The Abuse Attribution Inventory (Feiring, Taska & Lewis, 2002) Japanese translation; CASQ-R = Children's Attributional Style Questionnaire – Revised (Thompson et al., 1998); CWD-I = Coping with Discrimination Scale-Internalization subscale (Wei et al., 2010). DAQ = Depression Attribution Questionnaire (Kleim et al., 2011). PCTI-SB = Posttraumatic Cognitions Inventory Self-blame subscale (Foa et al., 1999); RAQ = Rape Attribution Questionnaire (Frazier, 2003).

Shame measures: AASQ = The Abuse Specific Shame Questionnaire (Feiring et al., 1998; Feiring & Taska, 2005); AASQ-Japanese = Abuse Specific Shame Questionnaire (Feiring et al., 1998; Feiring & Taska, 2005) Japanese translation; ESS = Experiences of Shame Scale (Andrews

et al., 2002); GASP Shame-NSE = Guilt and Shame Proneness Scale, Shame-Negative Self-Evaluation Subscale (Cohen et al., 2011); TRSI =

Trauma Related Shame Inventory (Øktedalen et al., 2014).

Trauma measures: CAPS-5 = The Clinician Administered PTSD Scale for DSM-5 (Weathers, Blake, et al., 2013a); CES = Combat Experiences

Scale (Hoge et al., 2004); HVF = History of Victimization Form (Wolfe et al., 1987); NSE = Negative Sexual Experiences (study designed

measure); MSES = Modified Sexual Experiences Survey (Messman-Moore et al., 2010); SHI = Stranger Harassment Index (Fairchild &

Rudman, 2008). PTSD measures: CITES II = The Children's Impact of Traumatic Events Scale II (Wolfe et al., 2002); CITES = The Children's

Impact of Events Scale (Wolfe et al., 1991); IES-R = Impact of Events Scale Revised (Weiss, & Marmar, 1997); PCL-5 = Posttraumatic Stress

Disorder Checklist for DSM-5 (Weathers, Litz, et al., 2013).

– Denotes authors did not report this information.

Aim 1: The Relationship Between Attributions, Shame, and PTSD

Table 2 presents a summary of bivariate correlations between key variables and key findings from each paper.

Child and Adolescent Studies

Cross-sectionally, all studies reported weak to moderate, albeit significant relationships between abuse specific attributions and PTSD symptoms. Consistently, abuse specific shame exhibited moderately strong relationships with PTSD symptoms.

Three studies examined relationships between key variables prospectively. Both Alix et al. (2020) and Feiring, Taska and Lewis (2002) found significant relationships between shame at baseline and PTSD symptoms at 6 months ($r = .44$, $p < .001$) and.12 months ($r = .67$, $p \leq .0001$). In contrast, Alix et al. (2020) found a significant relationship between abuse attributions as baseline and PTSD symptoms 6 months later ($r = .33$, $p < .001$). In terms of general attribution risk, Feiring, Taska and Lewis (2002) found weak significant relationship cross-sectionally for shame ($r = -.20$, $p \leq .01$), but not at follow-up. General attribution risk exhibited weak, non-significant relationships with PTSD at both baseline and follow-up.

Adult Studies

Across all adult studies, shame consistently exhibited a moderately significant relationship with PTSD symptoms. Similarly, attributions, measured either through attributional style of trauma-specific attributions exhibited a slightly weaker, albeit still significant relationship with shame and PTSD. Bhuptani and Messman (2021) was the only study that assessed trauma specific shame, shame-proneness, and state shame. Their study found that trauma-specific shame had the strongest relationship with both attributions and

PTSD. Shame proneness was not significantly related to both attributions and PTSD

symptoms.

Table 2

Summary of Studies Included in the Systematic Review

First author, year and country	Statistical Methodology	Relationship between attributions, shame, and PTSD symptoms		Key findings
		Attributions-shame	Attributions-PTSD Shame-PTSD	
Alix et al. (2017) Canada	Cross-sectional analysis: Sobel test: Mediation Bootstrapping: Mediation	.40, $p < .001$	.39, $p < .001$ .66, $p <. 001$	Self-blame attributions correlated with shame and PTSD. Shame partially mediated the relationship between self-blaming attributions and PTSD symptoms. Self-blame attributions and shame predicted 45% of variance of PTSD scores.
Alix et al. (2020) Canada	Longitudinal: Path analysis	.47, $p <. 001$	-	Only shame at baseline had a significant direct effect with PTSD symptoms at follow-up. Shame at T1 had the strongest relationship with PTSD symptoms at T2.
Feiring, Taska & Lewis (2002) United States	Longitudinal: Baron and Kenny regression analysis	.44, $p \leq .0001$	.34 $\leq .0001$ .65 $\leq .0001$	Internal attributions and shame were both correlated with PTSD symptoms, with shame demonstrating the strongest associations with PTSD. Shame did not mediate the relationship between negative attributional styles and PTSD symptoms one year after abuse discovery.

				Further analysis indicated that, a reduction in shame and abuse related attribution was predictive of improvements in PTSD symptoms.
Bhuptani & Messman (2021) United States	Cross Sectional: Path analysis, Parallel-Mediation Model.	.46, $p < .001$[1]	.32, $p < .001$ .69, $p < .001$[2]	General shame and rape-related shame both were significantly associated with self-blame and PTSD symptoms. Rape-related shame had the strongest relationship with PTSD symptoms. There was a significant indirect effect of self-blame on PTSD via rape related shame, but not via general shame.
Carretta & Szymanski (2020) United States	Cross sectional: Bootstrapping mediation and parallel mediation models.	.53, $p < .05$	.51, $p < .05$ .64, $p < .05$	Shame and self-blame were both significantly correlated with each other and PTSD symptoms. Shame had the strongest relationship with PTSD symptoms. Higher levels of stranger harassment were related to higher levels of self-blame and shame. Both these variables were related to more severe PTSD symptoms.
Uji, Shikai, Shono, & Kitamura (2007) Japan	Cross-sectional analysis: Structural Equations Modelling (SEM)	–	–	Internal attributions did not directly predict PTSD symptoms. However, there was a significant indirect effect between Internal attributions, shame, and PTSD symptoms.

Wojcik et al. (2022) United States	Cross-sectional analysis: Bootstrapping Mediation Models – Parallel and multiple independent variable mediation model	.63, *p* <. 001	.45, *p* <. 001 .54, *p* < .001	Self-blame and traumatic shame were both correlated with each other and PTSD symptoms. Traumatic shame had the strongest relationship with self-blame. Posttraumatic shame mediated the association between maladaptive schemas and PTSD symptoms when controlling for self-blame.
Zerach & Levi-Belz (2018) Israel	Cross-sectional analysis: Bootstrapping and Structural Equations Modelling	I = .51, *p* < .001 E = .49, *p* < .001	.43, *p* <. 001 I = .57, *p* <.001 E = .46, *p* <.001	Depressive Attribution Styles was significantly associated with shame and PTSD symptoms. The experience of moral injury was mediated by depressive attributions, trauma related intrinsic shame.

Note. [1]This correlation reflects the relationship between rape related shame and self-blame. Shame proneness and self-blame = .18

p < .001; General shame and self-blame = .31, *p* < .001. [2]This correlation reflects the relationship between rape-related shame and PTSD

symptoms. Shame proneness and PTSD = .09, ns; General Shame and PTSD = .28, *p* < .001.

I = Internal shame; E = External shame.

– Denotes authors did not report this information.

Aim 2: Does Shame Mediate the Relationship Between Attributions and PTSD?

Half of the studies ($n = 4$) in the review examined the possibility that shame might explain the relationship between attributions and PTSD symptoms. As not all coefficients were standardised, key findings are reported separately.

Child and Adolescent Studies

In Feiring, Taska and Lewis (2002), the authors examined whether shame mediated the relationship between general attribution risk and subsequent PTSD symptoms one year after discovery of sexual abuse. The authors did not find a mediation effect. However, further regression analyses indicated that, a reduction in shame ($\beta = -.20, p \leq .01$), and abuse related attribution ($\beta = -.31, p \leq .0001$), was associated with improvements in PTSD symptoms. Changes in both variables accounted for 19% of the variance in PTSD symptoms.

Alix et al. (2017) also found that shame also indirectly mediated the relationship between abuse specific attributions and PTSD symptoms ($\beta = .24, p < .05$), [95%CI = .14 to .35] and PTSD, with the indirect effect explaining 45% of variance in PTSD symptoms.

Adult Studies

Both Uji et al. (2007) and Bhuptani and Messman (2021) examined both direct and indirect effects of self-blame (internal attributions) and PTSD via shame in adult women who experienced some form of sexual assault. Both studies found significant indirect effects between internal attributions (self-blame) and PTSD via trauma-related shame. In Uji et al. (2007), there was a significant direct effect between shame and PTSD ($\beta = .40, p < .000$) and self-blame and shame ($\beta = .43, p < .000$). However, the indirect effect was not reported. Bhuptani and Messman (2021) found a larger direct effects for shame and PTSD symptoms ($B = .58, p < .001$) and for self-blame and rape-related shame ($B = .94, p < .001$). There was

an indirect effect for self-blame and PTSD ($B = .54$, 95% CI [.32 to .82] via rape related shame, but not for general shame ($B = .06$, 95% CI [-.00 to .17].

In contrast, Zerach and Levi-Belz (2018) examined whether the relationship between veterans who had experienced a potentially morally injurious event that involved betrayal (MIES-Betrayal) and their respective PTSD symptoms would be mediated by several psychological factors. In a serial integrated model, MIES-Betrayal was significantly associated with depressive attributions, and subsequently trauma related intrinsic shame and higher levels of PTSS. They found that two-step indirect effects to PTSD were significant ($\beta = .20$, $p < .01$; 95% CI [.05 to .51]). Specifically, MIES-Betrayal was significantly associated with depressive attributions ($\beta = .22$, $p < .01$), that associated with intrinsic trauma-related shame (.45, $p < .001$), which in turn was associated with more severe PTSD symptoms ($\beta =.29$, $p < .001$).

Discussion

The aim of this systematic review was to summarise the available evidence on the relationship between attributions, shame and PTSD, and the possibility that shame would explain the relationship between attributions and PTSD. The review was sparse, yielding only eight studies that met inclusion criteria. Majority of studies obtained from the search were excluded on the basis that they did not contain measurements of all key variables.

Studies with adult samples used a mix of convenient sampling across university and/or online or specifically from intervention centres. In contrast, all child studies (Alix et al., 2020; Alix et al., 2017; Feiring, Taska & Lewis, 2002) focused on CSA survivors and recruited participants from various child sexual abuse (CSA) treatment centres.

In terms of measures, child and adolescent studies utilised sexual abuse specific measures to assess for attributions and shame. Across adult studies, these measures varied, ranging from state and trait measures of shame to abuse specific measures and broad trauma-

related shame. Regardless of the trauma of interest, none of the studies assessed did not seek to obtain broader trauma history, and control for exposure as a potential confound. This is important as multiple trauma exposures is expected to be the rule, not the exception (Kessler et al., 2017) with increased trauma exposure related to more severe PTSD symptoms (Benjet et al., 2016; Karam et al., 2014). Regardless of what shame measure was used, across both child and adult studies, the most consistent finding was that shame was most strongly associated with PTSD symptoms. The relationship between attributions, trauma-specific or attributional style were also significantly associated with both shame and PTSD symptoms. These relationships were similar in magnitude. These findings were consistent with theoretical and empirical discussions indicating that self-blame is a key feature of PTSD, and associated with both shame and PTSD symptoms (Ehlers & Clark, 2000; Gómez de La Cuesta et al., 2019; Saraiya & Lopez-Castro, 2016).

The second aim of the review was to assess whether shame would mediate the relationship between attributions and PTSD. Although only half of studies included in the review reported on the mediation effect, indicating that shame mediates the relationship between attributions and PTSD. Nevertheless, further studies that utilise other trauma exposed samples and broad trauma attributions and shame measures will still be needed to generalise current findings. For example, majority of studies in this review were primarily focused on CSA or survivors of sexual assault. Except for Bhuptani and Messman (2021) and Wojcik et al. (2022), the remaining studies utilised abuse specific trauma and attribution measures that were designed for the body of research conducted by Feiring and colleagues (Feiring et al., 2001; Feiring, Taska, & Chen, 2002; Feiring et al., 1998; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005).

Similarly, although Zerach and Levi-Belz (2018) focused on veterans exposed to morally injurious events, the study utilised a depressive attributional style measure which

refers to the tendency to make depressogenic (internal, stable, and global) attributions across a range of negative events. Without prospective data, it is unclear to what extent attributional style functions as a predisposing factor toward shame independently of trauma exposure. It is likely that there is also a bidirectional effect between one's attributional style and trauma exposure. Further, although specific types of trauma exposure may increase the propensity for one to make internal attributions and experience shame, future empirical work assessing these constructs across different trauma types is still needed.

As majority of studies were cross-sectional, it is not possible to draw conclusions about causality. Optimistically, Alix et al. (2020) and Feiring, Taska and Lewis (2002) attempted to report longitudinal associations at baseline and follow-up, indicating that shame may be predictive of PTSD.

As both studies recruited participants from various CSA treatment centres, it was unclear whether participants had or were receiving any subsequent interventions between baseline and follow-up. Further, both studies only assessed change over two time points, which limits the characterisation of how strong this relationship holds over time. Future studies utilising multiple follow-up points could help clarify the prospective relationship between shame, PTSD, and maladjustment.

It is worth considering that studies included in the review used both DSM-4 and DSM-5 criteria for PTSD. As previously asserted, changes to the DSM-5 diagnostic criteria included an additional category that includes alterations in cognition and mood as a core symptom cluster. Within this, shame and self-blame are both potential diagnostic features. Despite this, none of the studies that utilised the DSM-5 criteria conducted sensitivity analyses to exclude this symptom cluster.

Limitations and Directions for Future Research

As far as the authors are aware, this is the first systematic review to investigate the relationships between attributions, shame, and PTSD across the lifespan. The current review included a rigorous method of searching and evaluating the relevant literature. A large number of databases were used, and a broad search strategy was employed to include all types of attributions and shame measures. PRISMA guidelines were followed, and there was strong interrater agreement for inclusion of studies between both reviewers. All included studies were peer-reviewed. However, there is still a risk of publication bias, as published articles tend to report positive findings.

The review examined the influence of attributions and shame on overall PTSD symptom severity. Accordingly, we included studies that reported on PTSD symptoms according to both the DSM-4 (APA, 2000) and DSM-5 (APA, 2013) criteria. The DSM-5 subsumes a broad range of emotional responses to trauma – including shame – within the negative alterations in cognitions and mood symptom cluster. Accordingly, there is a potential for further research to understand how attributions relate to shame when shame is considered part of PTSD itself.

The review also revealed some important methodological limitations within the literature. Included studies predominately consisted of female sexual assault survivors from childhood or adulthood. Thus, additional research is still needed in other population groups to generalise findings. Prospective studies using multivariate statistics that consider and/or control for the effects of potential risk factors, such as type of trauma history, time since trauma exposure and cumulative exposure, is encouraged (Brewin et al., 2000; Conrad et al., 2017; Tran et al., 2019).

The use of prospective, population-based studies could potentially inform the literature regarding possible fluctuations of shame over time and the relative stability and

relationships, if any of key variables over time. This would be useful in identifying whether targeting attributions will contribute to changes in shame and PTSD or vice versa.

Conclusions

Research has acknowledged shame as a key posttraumatic response, responsible for the maintenance and development of PTSD (Lopez-Castro et al., 2019). Theoretical models of shame indicate that causal attributions are key cognitive antecedent to shame (Tangney & Dearing, 2002; Tracy et al., 2007), which is theoretically consistent with current cognitive theories of PTSD (Ehlers & Clark, 2000). This review highlights some of the key findings that have examined attributions, shame, and PTSD. Unfortunately, methodological limitations of included studies limit the extent to which findings can be interpreted and generalised. Additional research is necessary to design appropriate measures relevant to broader trauma populations and to consider the impact of trauma history and type. The limited number of studies eligible for inclusion in our systematic review precludes definitive conclusions from being drawn. Nevertheless, the findings presented in this review indicate that appraisals such as internal causal attributions contribute to the development of shame and subsequently PTSD. As the experience of shame is not always volunteered or recognised, identifying, and taking into consider attributions as a potential pathway toward shame, clinicians can become more aware of the potential presence of shame and address it accordingly.

Prelude to Chapter 5

The studies in Study 3 suggest that individuals who attribute their traumatic experiences to internal causes will endorse higher levels of shame and PTSD symptoms. Unfortunately, majority of studies from the review did not utilise attribution measures that assessed the other causal dimensions of stability and globality which are critical to establishing the attribution-shame link (Tracy et al., 2007). Further, almost all the studies extracted in the review were focused on female sexual assault survivors, limiting the generalisability to other trauma exposed population.

Using a trauma specific causal attributions measure, the next study assessed the relationship between internal, stable, and global attributions and its relationship to shame and PTSD in a broad trauma exposed sample.

Chapter 5. Study 4: Shame mediates the relationship between negative trauma attributions and posttraumatic stress disorder (PTSD) symptoms in a trauma exposed sample.

The following chapter is published in the following article:

Seah, R. & Berle, D. (2022). Shame mediates the relationship between negative trauma attributions and posttraumatic stress disorder (PTSD) symptoms in a trauma exposed sample. *Clinical Psychology in Europe*, *4*(3): e7801.

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Abstract

Background: Theoretical models of self-conscious emotions indicate that shame is elicited through internal, stable, and global causal attributions of the precipitating event. The current study aimed to investigate whether these negative attributions are related to trauma-related shame and PTSD symptom severity.

Method: A total of 658 participants aged 18 to 89 ($M = 33.42$; $SD = 12.17$) with a history of trauma exposure completed a range of self-report measures assessing trauma exposure, negative trauma-related attributions, shame, and PTSD symptoms.

Results: Higher levels of internal, stable, and global trauma-related attributions were significantly associated with shame and PTSD. Shame mediated the association between trauma-related attributions and PTSD symptom severity, even after controlling for the effects of number of trauma exposures, worst index trauma and depression.

Conclusions: The present results suggest that negative attributions are a critical cognitive component related to shame and in turn, PTSD symptom severity. Future research should aim to replicate these findings in a clinical sample and extend these findings using prospective designs.

Keywords: Shame, posttraumatic stress disorder, PTSD, negative attributions, trauma

Highlights

• Cognitive antecedents of shame were investigated in a large trauma-exposed sample.

• Internal, stable, and global trauma attributions were associated with shame severity.

• Trauma-related shame mediated the association between trauma-related attributions

and PTSD symptoms.

• Specific attributions may be an important predictor of trauma-related shame.

Introduction

The exposure to a potentially traumatic event (PTE) often elicits a myriad of emotional responses that intensify traumatic stress reactions. Moreover, these reactions are thought to contribute to the development and maintenance of current threat characteristic of posttraumatic stress disorder (PTSD). Recently, there has been a growing interest in the role of shame as an important emotional trauma sequalae linked to poorer adjustment and maladaptive coping and predictive of the development of PTSD symptoms (e.g., intrusive recollections, hyperarousal and avoidance) (Saraiya & Lopez-Castro, 2016).

The cognitive model of PTSD offers a framework for understanding how shame may emerge following exposure to PTEs (Ehlers & Clark, 2000; Elwood et al., 2009). According to the model, the nature of the emotional responses in persistent PTSD varies according to appraisals of the trauma and its sequalae (Ehlers & Clark, 2000). For example, the model posits that appraisals concerning attributions of responsibility and perceived violation of internal and societal standards may evoke feelings of shame.

In line with this, theoretical models of shame classify it as a self-conscious emotion, as it arises when the self is implicated by a negative and aversive event that violates internal and/or external standards and evokes judgement from others (Gilbert, 1997; Lewis, 1971; Tangney & Dearing, 2002). Specifically, shame is said to arise through a cognitive-evaluative process, where the eliciting event is attributed to internal, stable, and global attributions; causes that relate to aspects of the individual that are present across all situations and likely to affect situations across one's life (e.g., one's character) (Lewis, 1971; Tangney & Dearing, 2002; Tracy & Robins, 2004). Guilt, which also arises from internal attributions, is distinct from shame in that the attribution pertains to a specific action (unstable) which does not affect all situations (Specific) (e.g., one's behaviour). This subtle difference in cognitive attributions is important as guilt and shame prompt distinct responses. The phenomenological

experience of shame is the desire to withdraw and hide due to perceived judgement from others and threat of being exposed (Gilbert, 2000). In contrast, guilt tends to prompt behavioural responses that are motivated by reparative efforts.

Indeed, higher levels of internal, stable, and global attributions has been associated with higher levels of PTSD. While, these studies have focused on negative attributional style, which is the tendency to attribute events to internal, stable and global causes to common negative and/or hypothetical life events (Elwood et al., 2009), PTEs can be considered phenomenologically distinct to general negative life events and exert greater influence on current PTSD symptoms (Gray & Lombardo, 2004; Reiland et al., 2014).

Following exposure to a traumatic event, posttraumatic shame may arise through this appraisal process, where the individual erroneously blames themselves for having caused the event. Consequently, the self is implicated in an unwanted event, and the trauma and its effects are appraised as having occurred due to the individual being inadequate or worthless in some way. 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, feelings of trauma related shame are likely to be painful, prompting avoidance that inhibits trauma processing, which impedes recovery (Leonard et al., 2020). For example, in their conceptual model of shame and adjustment in child sexual abuse survivors, Feiring et al. (1996) proposed that shame arises from sexual abuse through the mediation of cognitive attributions and that such shame in turn leads to poorer overall adjustment. A number of studies of child sexual abuse survivors have reported findings consistent with this model as well as the possibility that shame may mediate the relationship between negative attributions and PTSD symptom severity (Alix et al., 2017; Feiring, Taska, & Chen, 2002; Uji et al., 2007). Although promising, these studies utilised abuse specific attributions and shame measures which limit their generalisability to other

trauma exposed populations. Further, the attribution measure did not explicitly assess the dimensions of internal, stable and global attributions which is considered a necessary component of the attribution-emotion link to shame (Lewis, 1971; Tangney & Dearing, 2002; Tracy & Robins, 2004).

Although negative attributions are purported to be a cognitive antecedent to shame, there are several trauma characteristics that may impact the severity of posttraumatic cognitions and emotions. Firstly, although trauma exposure is insufficient to elicit trauma related shame, the nature of the traumatic event may function as a diathesis toward making more negative appraisals and higher levels of shame. For example, individuals with interpersonal trauma exposure, defined as an event that involves deliberate perpetration of harm to another individual (e.g., sexual assault, armed robbery, physical threats etc.) (Forbes et al., 2013) have reported increased levels of shame and PTSD (La Bash & Papa, 2014). In a recent study, Zerach and Levi-Belz (2018) found that experiencing a morally injurious event may contribute to an increased tendency to make internal, stable and global attributions, trauma related shame and more severe posttraumatic stress symptoms (PTSS). Their findings indicate that it is possible that certain trauma types may increase one's tendency to make negative attributions, subsequently eliciting higher levels of shame.

Secondly, routine self-report PTSD screening measures require a single designated trauma event to be used in assessing the severity of symptoms. However, the exposure to multiple potentially traumatic events can be considered a rule not the exception. There is robust evidence indicating that, with an increased number of PTE exposures, PTSD risk increases in a dose-dependent manner (Tortella-Feliu et al., 2019). Also, the severity of PTSD symptoms increases when participants are asked to rate symptoms across their trauma history (Simpson et al., 2011). Furthermore, the potential effect of time elapsed since the indexed trauma event may also impact endorsement of self-conscious cognitions and

emotions (Bryant, Creamer, O'Donnell, et al., 2017). Thus, consideration of the cumulative impacts of PTEs along with time since trauma exposure is pertinent.

Regardless of overall trauma exposure, it is expected that individuals will seek to assign meaning and provide causal attributions to explain their experiences. Thus, the current study sought to extend previous findings in two ways. Firstly, it aimed to investigate the relationships between trauma specific negative attributions (higher internal, stable, and global attributions) shame and PTSD symptom severity in a broad sample of trauma exposed survivors. Based on previous findings, it was hypothesised there would be significant associations between negative attributions, shame, and PTSD symptoms. Secondly, it explored whether trauma-related shame would mediate the relationship between higher levels of internal, stable, and global attributions on the one hand, and PTSD symptoms on the other.

To examine the unique contributions of trauma related attributions and shame in relation to PTSD, the current study controlled for the effects of the various trauma characteristics mentioned. This included cumulative lifetime exposure to PTEs, reference trauma type (interpersonal vs. non-interpersonal) and time elapsed since reference trauma. Symptoms of depression were also controlled for due to depression's significant comorbidity with PTSD (Flory & Yehuda, 2015). It was hypothesised that even after controlling for these covariates, trauma-related shame would mediate the relationship between attributions and PTSD symptom severity.

Method

Participants

Six Hundred and sixty-seven participants consented to participate in the study, however nine participants failed the attention checks, and were excluded from the analyses. The final sample consisted of 658 participants between the ages of 18 to 89 ($M = 33.42$; *SD*

= 12.17) who consented to participate in the study. A majority ($n = 257$; 39.06%) of the sample resided in the United States, with a similar proportion from the United Kingdom ($n = 249$; 37.84%). The sample consisted of 346 women (52.58%), 300 men (45.56%) and 12 (1.82%) preferring to self-describe. Just over half the participants ($n = 371$; 56.38%) reported being in a relationship or were married, 258 (39.21%) had never been married and 29 (4.41%) were either separated or divorced. Slightly under half ($n = 206$; 31.31%) of participants disclosed at least one mental health disorder diagnosis from a professional. Among those who chose to specify, 223 ($n = 33.89\%$) reported a current diagnosis of depression and/or anxiety. 80 participants reported currently seeking mental health support from a healthcare professional. Just over half of participants' (58.7%) self-reported PTSD symptoms placed them within the clinical range for a provisional PTSD diagnosis (PCL-5 total scores ≥ 31) (Bovin et al., 2016).

Participants endorsed exposure to an average of 6.3 ($SD = 2.2$) potentially traumatic events (PTE) across their lifetime. In terms of type of trauma exposure, transportation accidents ($n = 406$; 61.70%), severe life-threatening illnesses ($n = 227$; 34.50%), and unwanted/uncomfortable sexual experiences, including sexual assault ($n = 209$; 31.76%) were the most common trauma categories endorsed. The most common reference trauma endorsed was some form of direct exposure (personally experienced and/or witnessed it happening to a close family member/friend) to an interpersonal trauma (e.g., physical and/or sexual assault and psychological abuse) ($n = 219$; 33.28%), followed by some form of transport accident ($n = 154$; 23.40%), and various forms of illnesses and/or physical injury ($n = 109$; 16.57%). The mean elapsed time since the reference trauma was 11.6 years ($SD = 10.7$).

Measures

The Lifetime Events Checklist (LEC)

The LEC (Weathers, Blake, et al., 2013b) is a 17-item self-report measure used to screen for exposure to potentially traumatic events (PTE) in a respondent's lifetime. It consists of 16 known events and an additional item assessing any stressful life events not listed. Respondents indicate their level of exposure for each PTE on a 6-point nominal scale. Following this, participants are asked to identify and briefly describe the worst event they experienced, specifically the event that they classify as the most distressing. This event was used as the reference trauma for assessing current symptoms of PTSD. The LEC does not yield a total composite score. The LEC demonstrated adequate psychometric properties as a stand-alone measure for trauma exposure (Gray et al., 2004). In the current study, a total lifetime trauma load was calculated by summing the number of traumatic experiences across each type of trauma endorsed by the individual.

The PTSD Checklist for DSM-5 (PCL-5)

The PCL-5 (Weathers, Litz, et al., 2013) a 20-item self-report questionnaire which was administered to assess PTSD symptoms. Participants endorse the extent to which they were bothered by PTSD symptoms in relation to their reference trauma in the past month (e.g., "Repeated disturbing and unwanted memories of the stressful experience") on a 5-point Likert Scale, 0 (*Not at all*) to 4 (*Extremely*). A total symptom severity score was obtained by summing each item, with a score higher than 31 indicating the presence of probable PTSD (Bovin et al., 2016). The PCL-5 has demonstrated strong reliability and validity and is psychometrically sound instrument for quantifying PTSD symptom severity (Bovin et al., 2016).

The Expanded Attributional Style Questionnaire (EASQ)

The EASQ (Peterson & Villanova, 1988) is a measure used to assess a respondent's tendency to generate specific attributions for hypothetical aversive events. Participants are asked to rate the cause of each event. On this scale, respondents are asked to rate the cause of each event on 7-point Likert scale for three dimensions; 1) Internal or External ("Is the cause something about you or about other people and/or circumstances"), 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?"). The EASQ has previously demonstrated adequate to good internal consistencies (Peterson & Villanova, 1988).

The EASQ was adapted by Reiland et al. (2014) to assess trauma related attributions. On the EASQ-Trauma, participants rate the cause of each traumatic event they were exposed to according to the LEC (Weathers, Blake, et al., 2013b) on the EASQ dimensions of Internal-External, Stable-Unstable and Specific-Global. The score on each attribution dimension ranged between 1 and 7. An overall attribution score or negative trauma score was calculated by averaging the sum of each dimension. Higher overall scores on the scale indicate higher levels of internal, stable, and global attributions.

The Trauma Related Shame Inventory (TRSI)

The TRSI (Øktedalen et al., 2014) is a 24-item measure of trauma related shame. Respondents rate the extent that they experience thoughts and feelings associated with shame in relation to their traumatic experiences over the past week on a 4-point Likert Scale, 0 (*Not true of me*) to 4 (*Completely True of me*). Sample items include "Because of what happened, I am disgusted with myself", "If others knew what happened to me, they would be ashamed". A total trauma-related shame score was computed by summing all items on the TRSI. The

TRSI has demonstrated strong content and construct validity and discriminate validity from the Trauma Related Guilt Inventory (Kubany et al., 1996).

The Depression Anxiety and Stress Short Form Scale (DASS-21)

The DASS-21 (Lovibond & Lovibond, 1995) is a widely used screening measure of distress in both clinical and non-clinical settings. It consists of 21 items comprised of three self-report scales of depression, anxiety, and stress symptoms. In the current study, only the 7-item depression subscale was used to yield a total depression score. Respondents endorse the extent to which they experienced symptoms over the past week on a 4-point Likert scale, 0 (*Did not apply to me at all*) to 4 (*Applied to me very much, or Most of the time*). A total depression score was computed by summing all the items on the depression subscale. The DASS-21 has demonstrated good discriminant validity relative to other depression measures and high internal consistency (Henry & Crawford, 2005).

Procedure

Participants were recruited from Australia, Canada, Ireland, The United Kingdom and United States via Prolific Academic (ProA), an online crowdsourcing platform. Only participants over the age of 18 and who endorsed being exposed to at least one potentially traumatic event (PTE) within their lifetime according to the LEC (Weathers, Blake, et al., 2013b) were included in the study. Participants were administered a battery of self-report questionnaires which assessed their lifetime exposure to PTEs, along with their attributions for these events, trauma related shame, PTSD symptoms and symptoms of depression and anxiety.

Statistical Analyses

Spearman's rank order correlations were calculated given the non-normal positively skewed distributions of depression, PTSD, and trauma-related shame. Bootstrapping (5,000)

iterations were performed to test the indirect effects of shame and negative attributions in relation to PTSD symptom severity using conditional process analysis (Hayes, 2017). Trauma exposure, depression symptoms, worst reference trauma type, and time since worst reference trauma were entered as covariates.

The use of bootstrapping, a non-parametric resampling method offers an advantage over the traditional Sobel Test as it does not require the assumption of normality to be met for the product of coefficients. Further, the resampling methods minimises bias that arises from non-normal sampling distributions (Hayes, 2017). Indirect effects are significant when the 95% Confidence Interval (CI) does not contain zero.

Results

Univariate and Bivariate Statistics

Mean, standard deviation and range of all self-reported measures are reported in Table 1. The internal consistency for all scales was excellent. All measures were significantly and positively correlated with each other and small to moderate in magnitude (Table 2).

Table 1

Means, Standard Deviations, and Reliability of Measures

Variable	M (SD)	Range	Cronbach's α
Exposure (LEC)	6.31 (2.16)	2-16	-
Depression (DASS-21)	6.67 (6.26)	0-21	.94
Internal attributions (EASQ-T Internal)	2.45 (1.43)	1-7	-
Stable attributions (EASQ-T Stable)	3.73 (1.63)	1-7	-
Global attributions (EASQ-T Global)	3.34 (1.56)	1-7	-
Attributions (EASQ-T Total)	3.17 (1.07)	1-6.58	-
Shame (TRSI)	14.33 (15.94)	0-70	.97
PTSD (PCL-5)	27.78 (19.59)	0-80	.95

Note. Exposure = Total lifetime trauma exposure to distinct trauma types; Depression = Depression symptoms; Internal, stable, and global = internal, stable, and global trauma-related attributions; Attributions = Total trauma related attributions; Shame = Trauma Related Shame; PTSD = PTSD symptoms.

Table 2

Spearman's Rank Order Correlations between Trauma Exposure, Depression Symptoms Trauma-related Attributions, Trauma Related Shame, PTSD Symptoms

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Exposure		.16**	.10**	.10**	.08	.13**	.30**	.19**
2. Depression			.27**	.16**	.14**	.31**	.59**	.56**
3. Attributions				.54**	.73**	.79**	.27**	.29**
4. Internal					.04	.23**	.25**	.20**
5. Stable						.42**	.04	.08*
6. Global							.35**	.37**
7. Shame								.66**
8. PTSD								

Note. $N = 587$. Exposure = Total lifetime trauma exposure to distinct trauma types (LEC); Depression = Depression symptoms (DASS-21); Attributions = Total trauma related attributions (EASQ-Total); Internal, stable, and global = internal, stable, and global trauma-related attributions (EASQ-T subscales); Shame = Trauma Related Shame (TRSI); PTSD = PTSD symptoms (PCL-5).

   **$p < .01$, *$p < .05$.

Mediation Analysis

Figure 1 reports the results of the bootstrapped mediation analysis. Together, after controlling for lifetime trauma exposure, depression symptoms, worst trauma type, and time since worst trauma, negative attributions and trauma-related shame accounted for significant variance in PTSD symptom severity, $F(6,652) = 107.53$, $R^2 = .50$, $p = .00$. Trauma related negative attributions exhibited significant direct effects on shame, $B = 1.47$, $p = .00$, 95% CI

[0.56 to 2.38], and shame also had a significant direct effect on PTSD symptoms, $B = .57$, $p =$ .00, 95%CI [0.48 to 0.66]. Trauma related attributions exhibited a significant indirect effect on PTSD symptoms via shame, 95%CI [0.35 to 1.34].

However, when trauma related shame was included in the model, the direct effect of trauma-related attributions remained significant, $B = 1.78$ $p = .00$, 95% CI [0.72 to 2.84], indicating that trauma-related shame partially explains the relationship between trauma-related casual attributions. Thus, it is likely that there are additional mediators that could contribute to the understanding the effect of negative trauma attributions and PTSD symptoms.

Figure 1

The Relationship Between Trauma-Related Attributions and PTSD Symptom Severity Mediated by Trauma-Related Shame

a: B = 1.47, β = .10, SE = .46 95% CI [.56 to 2.38]

b: B =.57, β =.46, SE = .05, 95% CI [.48 to .66]

Trauma related shame

c: B = 2.62, β = .140, SE =.60, 95% CI [1.45 to 3.79]

Trauma-related attributions

c': B = 1.78, β = .10, SE = .54 95% CI [.72 to 2.84]

PTSD Symptom Severity
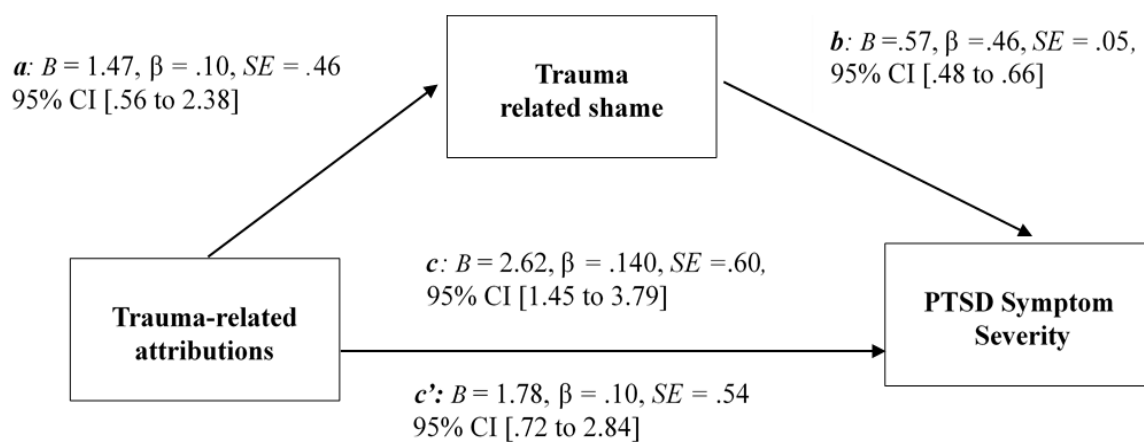
Note. c = total effect; c' = direct effect; B = non-standardised regression coefficient; β = standardised regression coefficient; SE = standard error; CI = confidence interval. Indirect effect = 95% CI = [0.35 to 1.34].

As a secondary exploratory analysis, we repeated the mediation analyses for each separate attribution dimension. The results of these are presented in Supplementary Material.

In brief, both internal [95% CI = .53 to 1.30] and global [95%CI = .32 to 1.10] attributions exhibited significant indirect effects on PTSD symptoms via shame. In contrast, there was no significant indirect effect for stable attributions [95% CI = -.65 to .03].

Discussion

To our knowledge, this is the first study that examines the role of internal, stable, and global trauma-related attributions in relation to shame and PTSD symptoms in a broad trauma exposed sample. The purpose of the study was two-fold. Firstly, it aimed to investigate the relationship between negative attributions (higher levels of internal, stable, and global attributions), trauma-related shame and PTSD. Secondly, it investigated whether trauma-related shame would mediate the relationship between negative trauma-related attributions and PTSD symptoms.

As predicted, negative attributions, that is, higher levels of internal, stable, and global attributions and trauma-related shame both had significant direct effects on PTSD symptom severity. Interestingly, although cumulative trauma exposure is an important risk factor for PTSD (Tortella-Feliu et al., 2019), correlation analysis of the present data indicated that the relationship between trauma load and PTSD is negligible. These findings are consistent with both empirical and theoretical evidence implicating maladaptive cognitive appraisals and subsequent emotional reactions as important predictors of PTSD beyond trauma exposure (Cromer & Smyth, 2010; Ehlers & Clark, 2000).

The finding that internal, stable and global attributions are significantly associated with higher levels of PTSD is consistent with previous research indicating strong associations between negative causal attributions and PTSD symptoms (Gómez de La Cuesta et al., 2019). The attribution that one's experiences are due to internal causes that are unchanging, and pervasive in all domains of life is likely to increase expectancy that future events would reoccur and engender feelings of helplessness and loss of control over life events and one's

future (Mikulincer & Solomon, 1988). Indeed, a sense of helplessness has been associated with a perception of ongoing threat and perceived lack of safety among domestic violence survivors (Salcioglu et al., 2017). Moreover, findings from neuroimaging studies have indicated that cognitive distortions are linked to PTSD through intense re-experiencing of the trauma memory elicited by trauma related cues (Berman et al., 2018; Daniels et al., 2011).

As our findings indicate, negative attributions of the traumatic event were associated with higher levels of trauma-related shame which in turn, were associated with more severe PTSD symptoms. Thus, the appraisal that negative events are due to internal, stable, and global attributions may lead to the focus of evaluation being directed inward where the self and its entirety is judged negatively, prompting feelings of intense shame. The cross-sectional nature of our study precludes causal inferences; however, further prospective studies of these variables should seek to confirm this possibility.

The phenomenological experience of shame is painful, motivating the desire to withdraw and hide due to the fear of rejection or stigmatisation. In this way, feelings of shame may increase the intensity of PTSD symptoms through responses such as avoidance (Feiring, Taska, & Chen, 2002; Leonard et al., 2020), a core symptom of PTSD that maintains overgeneralised fear and inhibits new learning (Craske et al., 2008). Indeed, a recent study indicates that experiential avoidance may be one of the key mechanisms that explains the relationship between shame and PTSD symptoms (Leonard et al., 2020). However, future research will be needed to bolster such findings. In addition, current theoretical models of shame indicate that feelings of shame are also avoided due to their association with the event and trauma related cues (Lee et al., 2001; Wilson et al., 2006). Consequently, the inability to process shame is likely to intensify these feelings where, in the absence of physical danger, feelings of shame become a source of internal threat.

Although the current results support our second hypothesis, there may be other variables that influence and explain the relationship between shame and PTSD. Following trauma exposure, shame is typically accompanied by other emotional responses such as fear, guilt, alienation, and betrayal that also promote avoidance and intense reliving of trauma memories (Dewey et al., 2014; Held et al., 2015). Moreover, there may be other attributional processes such as perceived controllability and importance of events (Tracy & Robins, 2006) that may be relevant to shame worth investigating.

Overall, the findings support the assertion that individual variability in trauma attributions and reactions are linked to not only an increase in PTSD symptom severity, but this relationship can also be explained by emotional and behavioural reactions associated with shame related to one's traumatic experiences.

Some limitations of the current study should be noted as avenues for future research. First, the use of a cross-sectional design precludes any causal inferences. It is likely that both negative appraisals and trauma related shame have a bi-directional relationship, however the extent to which they reinforce each other remains an empirical question. Thus, longitudinal research is needed to assess the directionality of these constructs. Second, although the use of self-report questionnaires is common in clinical psychology research, they may be biased in several ways as responses are subject to participants' introspective ability and response biases. Third, additional demographic data was not obtained with respect to ethnicity, or employment status which may be important risk factors for PTSD (Tortella-Feliu et al., 2019). Also, not all participants in our sample were in the clinical range for PTSD, limiting the generalizability of our results to clinical populations.

Fourth, the construct validity of the "global" dimension of the EASQ may be imperfect in that the global dimension items appeared to assess attributions about the perceived consequences of traumas, rather than attributions about the cause itself ("Is this

cause something that affects just this type of situation, or does it also influence other areas of your life"). This may have contributed to the relatively stronger associations observed between global attributions and PTSD symptoms when compared with the internal-external and stable-variable dimensions. Future studies should ideally use interviewer-based approaches to allow careful distinctions between attributions about the causes versus the consequences of trauma events.

Further, although the PCL-5 is widely accepted and utilised within trauma research as a PTSD symptom screening tool, it does not examine trauma relatedness of symptoms and significant overlap between PTSD and other psychiatric symptoms may inadvertently inflate PTSD symptom severity scores (Monson et al., 2008). It is worth noting that an individual can make multiple attributions for a single event, especially when the event consists of multiple, closely related events. In the attempt to account for multiple lifetime exposures, we assessed attributions for all PTE exposures. However, an individual can have multiple exposures to the same type of traumatic event, complicating the identification of the particular event that a given attribution corresponds to. Thus, assessment of the index trauma event to assess event specific attributions using a clinician administered diagnostic assessment tool is warranted. For example, the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) (Weathers, Blake, et al., 2013a) could be used to identify the index trauma and assess specific attributions in accordance with the event. Further, the use of a diagnostic interview can provide a more accurate diagnostic picture of PTSD symptoms and increase the generalizability of current findings to clinical samples.

Although specific attribution dimensions may exert greater influence on shame and PTSD symptoms than others, the results indicate that, together, internal, stable, and global attributions for lifetime exposure to PTEs functions as a potential cognitive vulnerability toward trauma related shame. Thus, targeting these cognitions may constitute an important

mechanism for trauma recovery. Cognitive based interventions that utilise attribution retraining such as Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992) has been found to be useful in modifying self-blaming attributions and PTSD (Resick et al., 2002). Moreover, there is some indication that gradual exposure to and processing of trauma memories can significantly reduce shame based cognitive distortions (Cohen et al., 2004). More recently, there has been increasing interest and empirical support for the use of compassion-based therapies are a potential adjunct to existing cognitive interventions for PTSD in facilitating the effectiveness of cognitive reappraisal strategies (Au et al., 2017).

Overall, the present study indicates that following exposure to a PTE, negative attributions are associated with shame, which in turn is associated with higher levels of PTSD symptoms. The findings underscore the potential clinical utility of assessing negative attributions as a potential antecedent of shame. In doing so, clinicians can seek to target these processes and potentially change the trajectory of shame responses and reduce the emotional impact of the trauma and the severity of PTSD symptoms.

Prelude to Chapter 6

Chapter 5 (Study 4) presented the first study to empirically confirm the relationship between causal attributions (internal, stable, and global attributions) shame and PTSD. Thus far, symptoms of PTSD have been assessed using self-report measures, which has the potential to misclassify psychopathology. To qualify for a diagnosis of PTSD, individuals must first endorse exposure to a Criterion A stressor followed by a constellation of symptoms tethered to this specific event (APA, 2022). According to Stein et al. (2016), for individuals who experience multiple traumas, each trauma type can result in different trauma symptoms, and together fulfil the diagnostic criteria for PTSD. Further, individuals who experience multiple traumas within the same trauma type may have difficulties attributing symptoms to a specific event (e.g., experience of assault during combat deployment; see Boyd et al., 2013; Mattocks et al., 2012; Street et al., 2009). Similarly, traumas can also interact with each other (Gross et al., 2018; Kelly et al., 2011; Scott et al., 2014), making it difficult for individuals to accurately attribute symptoms to their assigned event. Thus, the use of a structured or semi-structured diagnostic interview can help yield more accurate results.

Chapter 6 aimed to replicate the findings from Chapter 5. The gold-standard instrument for assessing and diagnosing current PTSD symptoms, Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) (Weathers, Blake, et al., 2013a) was administered to establish current diagnoses of PTSD and quantify symptom severity. Findings from Studies 1, 2 and 4 also indicated that depression had a consistently strong relationship with both shame and PTSD. Considering this, the next study also explored possible reasons for this, and the influence of depression on the relationship between shame and PTSD was also investigated.

Chapter 6. Study 5: Negative attributions as a source of vulnerability for trauma-related shame and PTSD symptoms

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A correction was made due to an error with Figure captions:

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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

Introduction

Following trauma exposure, the experience of prolonged psychological sequalae 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; Lewis, 2003; Tangney,

Wagner, & Gramzow, 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 & Hulsey, 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, Taska, & Chen, 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 Abramson's (1989) Hopelessness Model of Depression (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, Wagner and Gramzow (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 attributional 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, 2022). 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 between negative

attributions and shame, and the relationship between shame and PTSD. It is hypothesised that

the mediation model of interest will vary significantly as a function of depression (Figure 1).

Figure 1

Proposed Moderated-Mediation Model
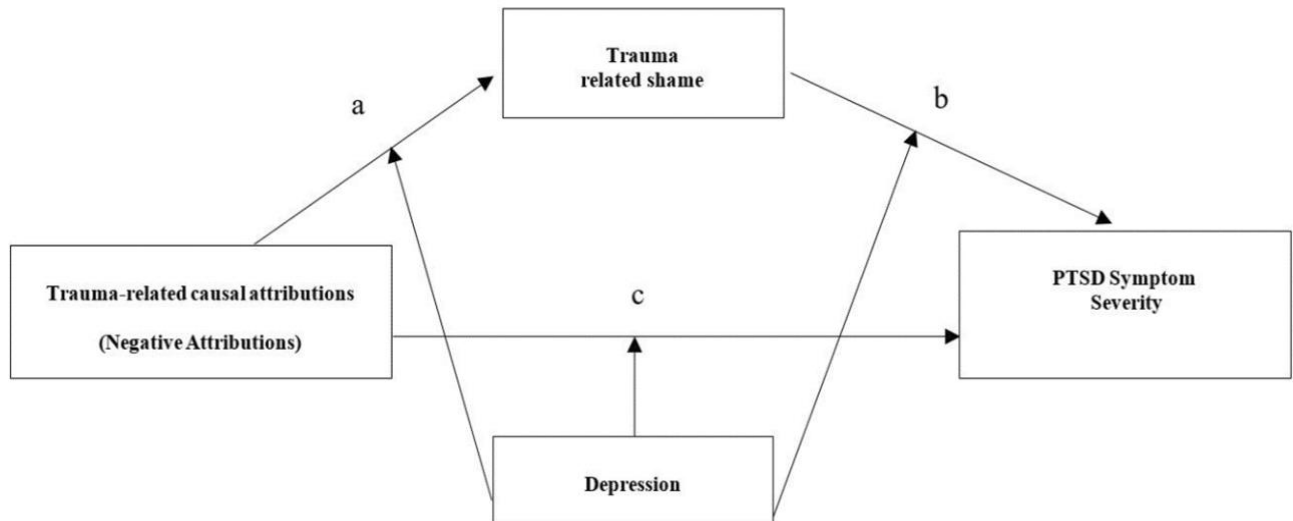
Method

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 through 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 and 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, Blake, 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. The total CAPS-5 scores range from 0-80. 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 analysis. The final sample comprised of 87 participants, 34 men (39.08%) and 53 women (60.92%), 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. 55 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 (42.53%) participants of the final sample reported receiving past mental health treatment from a psychologist, a psychiatrist and/or other mental health professional (n = 25, 28.74%). At the time of the study, 33 (37.93%) 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]). 32 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; 75.86%), transportation accident (n = 61; 70.11%) and unwanted and/or uncomfortable sexual experiences (n = 52; 59.77%). Participants' index trauma had occurred on average 13.3 years ago (SD = 12.8). Sixty-five participants (74.71%) 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; 52.87%) 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, Blake, 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 (TRSI; 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 construct 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 quantity 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 ($N = 50+8K$) 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, was required

(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 .30 were interpreted as low,

between .30 to .50 as medium and those above .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 (Figure 2).

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 .01 to .08 are classified as small, .09 to .24 as medium and .25 above as large (Preacher & Kelly, 2011).

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.

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	.97
Depression	10.4 (7.3)	0-27	.91
PTSD	22.0 (14.7)	0-65	.85

Note. Time = Time since worst trauma exposure; Exposure = Number of exposures to trauma types; Trauma attributions = Trauma related Causal Attributions; Shame = Trauma Related

Shame; Depression = Depression Symptoms; PTSD = Posttraumatic Stress Disorder

Symptoms.

Table 2

Correlations Between Trauma Exposure, Trauma-related Causal Attributions, Shame,

Depression and Posttraumatic Stress Disorder Symptoms

Variable	PTSD	Exposure	Depression	Attributions	Shame
Exposure	.25*	-			
Depression	.72**	.33**	-		
Attributions	.36**	.13	.25*	-	
Shame	.62**	.27*	.71**	.26*	-

Note. Exposure = Number of exposures to trauma types; Depression = Depression

Symptoms; Attributions = Trauma related Causal Attributions; Shame = Trauma Related

Shame; PTSD = Posttraumatic Stress Disorder Symptoms.

p < .05, **p* < .01

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 Figure 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.

Figure 2

Mediation Model
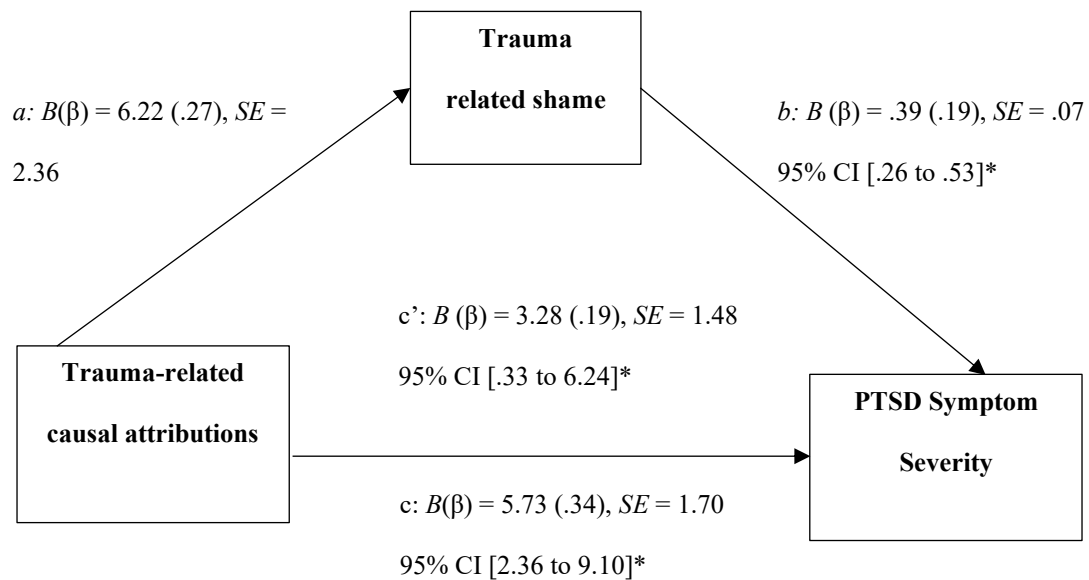
Note. *N* = 87. *p < .05.

Moderated Mediation

The overall moderated mediation model was significant $F(7,79) = 16.75$, $R^2 = 0.60$, $p = .00$. (Table 3). 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' Figure 1). The effect of depression severity in the relationship between shame and PTSD symptoms was also not statistically significant (path 'b' Figure 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 Analyses

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

Table 3

The Moderating Effect of Depression on Attributions, Shame, and PTSD Symptoms

	Mediator variable: Trauma related shame				Dependent variable: PTSD symptoms			
	B	*SE*	*p*	95%CI for *B*	*B*	*SE*	*p*	95%CI for *B*
Control variables								
Exposure	.07	.52	.89	-.97 to 1.11	.15	.35	.67	-.54 to .84
Time Since Trauma	-.08	.13	.55	-.33 to .18	.07	.08	.41	-.10 to .23
Predictors								
Attributions	4.27	3.14	.18	-1.96 to 10.51	5.83	2.20	.01	1.46 to 10.21
Shame					.07	.13	.59	-.19 to .32
Depression	2.26	.87	.01	.53 to 3.99	1.02	.59	.00	.84 to 3.20
Interaction 1	-.17	3.13	.18	-1.96 to 10.51	-.33	.18	.07	-.68 to .03
Interaction 2					.01	.01	.47	-.01 to .03
R^2	.46*				.60*			
F	14.06				16.75			

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

Discussion

The current study sought to 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 as well as 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, Taska, & Chen, 2002; Uji et al., 2007), and a range of adult trauma survivors (Seah

& Berle, 2022). 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 and 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 imply 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 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. Thus, future research may seek to utilise a structured diagnostic interview such as the Structured Diagnostic Interview for DSM-V (First, 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.

Prelude to Chapter 7

Findings across each study confirm that shame is critical in the development and maintenance of PTSD, which has important clinical implications. However, findings thus far are based on community populations, and it is unclear whether they generalise to clinical treatment populations. The final chapter within this program of research aimed to investigate shame's response to existing PTSD treatment and how its presence potentially influences treatment response and outcome. Routine clinical data was collected from an outpatient treatment program and analysed accordingly.

Chapter 7. Study 6: Changes in shame and PTSD symptoms within an outpatient trauma hospitalisation program

The following chapter has been submitted for publication and is under peer review:

Seah, R., Rogers, K., Steel, Z. & Berle, D. (2023). Changes in shame and PTSD symptoms within an outpatient trauma hospitalisation program. *Psychiatry Research* (Submitted/Under Review).

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Abstract

Background: Shame is an important trauma response that is associated with and maintains PTSD symptoms over time. There is preliminary evidence suggesting that shame responds to current evidence-based PTSD treatments and influences treatment response. However, it is unclear whether shame responds to treatment within a routine PTSD outpatient hospital setting.

Aims: The present study aimed to assess whether shame responds to routine outpatient PTSD treatment program among first responders with a background of occupational trauma. It also investigated whether shame is associated with treatment outcomes and whether it can be used to predict changes in PTSD symptoms across treatment.

Method: Sixty-five patients completed pre and posttreatment measures of PTSD symptom severity, shame, depression, anxiety, and demographic variables. A paired t-test was used to determine if there were a significant difference between pre and post measures of shame and PTSD symptoms. A bivariate linear mixed model was used to examine the relationship between changes in shame and PTSD across treatment.

Results: Participants exhibited significant reductions in PTSD symptoms posttreatment. There was not a significant reduction in shame symptoms, and findings indicate that shame did not influence or predict changes in PTSD symptoms across treatment.

Discussion: The results suggest that although shame is a relevant factor in treating PTSD, it did not respond to the current treatment protocol. Regardless, future research is needed to replicate these findings in a larger sample in other clinical settings.

Keywords: Shame, PTSD, treatment, CBT, group therapy, cognitive processing therapy

Introduction

Posttraumatic stress disorder (PTSD) is a highly debilitating psychiatric disorder resulting from exposure to extraordinary stressful and potentially traumatic events (Bromet et al., 2018; Kessler et al., 2017). Traditionally, PTSD has been considered a anxiety-based disorder characterised by pathological fear associations between the trauma reminders and associated stimuli that provoke a sense of current and ongoing threat (Foa & Kozak, 1986; Foa & McNally, 1996). The restructuring of the diagnostic groupings in the Diagnostic Statistical Manual (DSM-5) has lead PTSD being placed into an independent category of Trauma and stressor related disorders (American Psychiatric Association [APA], 2022). Following this, emotions such as shame have started to gain increased recognition as a core affective response to trauma. Shame is not only associated with more severe PTSD symptoms (Alix et al., 2020; Andrews et al., 2000; Dewey et al., 2014; Feiring, Taska, & Chen, 2002; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005; Seah & Berle, 2022), but has been found to maintain PTSD, up to six years post trauma (Andrews et al., 2000; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005; Uji et al., 2007).

Shame is a self-conscious emotion that signals a threat toward public exposure, and potential rejection and judgement from others. It arises when individuals attribute events to global, stable aspects of the self that confirm negative self-representations or when the event violates standards for probity (Lee et al., 2001; Tracy et al., 2007; Tracy & Robins, 2004). Such interpretations lead to negative self-appraisals (e.g., "I am bad") and feelings of worthlessness, incompetence, and a diminished sense of self (Lewis, 1971; Lewis, 1992; Lewis, 2003) along with the desire to hide and withdraw oneself.

According to Ehlers and Clark's cognitive model of PTSD (Ehlers & Clark, 2000), differences in trauma appraisals and its sequalae are responsible for the perception of current and ongoing threat. However, such threat extends beyond physical danger and fear. Shame

signals a threat of impending social rejection that is driven both internally and/or externally by perceptions of one's own inferiority and inadequacy, rendering the individual vulnerable and exposed.

Current models for understanding the effectiveness of exposure-based therapies (e.g., Prolonged Exposure; Foa et al., 2007), the treatment of choice of PTSD, highlight the role of fear extinction. It is unclear whether other negative emotional appraisals such as shame will respond to an exposure-based treatment, given the likelihood that it is maintained by different processes (Lopez-Castro et al., 2019). Shame has been recognised as one of the emotional states associated with PTSD (Lopez-Castro et al., 2019; Saraiya & Lopez-Castro, 2016) (Andrews et al., 2000; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005; Lopez-Castro et al., 2019; Saraiya & Lopez-Castro, 2016; Uji et al., 2007). However, research investigating the effectiveness of in addressing shame, is only just emerging. with several researchers suggesting that shame may stifle the therapeutic effects of exposure-based treatment (e.g., Pitman et al., 1991; Resick & Schnicke, 1992).

Several evidence-based treatment approaches have more structured frameworks for addressing shame-based appraisals. For example, Cognitive Processing Therapy (CPT) (Resick et al., 2016; Resick & Schnicke, 1992), draws on cognitive behavioural principles, targeting dysfunctional negative appraisals of the trauma and its sequalae, then with regards to the events related to beliefs about self and other. It also directly addresses the memories, thoughts and feelings associated with the traumatic event and aims to decrease dysfunctional cognitive and behavioural strategies (Bisson & Olff, 2021; Foa et al., 2010). Both cognitive therapy (CPT-C) alone and a combination of CPT-C and Written Accounts (WA) have been shown to be effective in decreasing shame and PTSD (Resick et al., 2008).

Other treatment modalities such as Dialectical behaviour therapy (DBT) have been adapted to treat PTSD in combination with Prolonged Exposure (DBT-PE; Harned et al.,

2012) to address high rates of co-occurring emotion dysregulation. As with CPT, this treatment modality is effective in treating shame (Harned et al., 2012; Harned et al., 2014; Harned & Linehan, 2008).

A major limitation to date is that almost all the research undertaken of trauma focused treatments have been restricted to populations exposed to female sexual assault survivors, where experiences of shame are axiomatic of the nature of trauma experience (Badour et al., 2017; Herman, 2011). The one exception to this, is the study by Øktedalen et al. (2015) which examined the effectiveness of standard exposure based treatments within a general inpatient trauma population. The study found that standard exposure treatment was effective in addressing trauma related shame, with changes in shame predicting changes in PTSD. However, within this study, the focus of exposure therapy for the majority of participants was an interpersonal trauma (e.g., physical, and sexual assault). Thus, it is unclear whether shame experienced in other population groups will respond to routine exposure-based treatments.

First responders, such as police officers, firefighters and ambulance personnel are amongst one of the most regularly trauma exposed groups in the community, with prevalence rates of PTSD ranging from 8-22% (Klimley et al., 2018). Observational research has found that shame is critical in this group. For example, responders often delay treatment due to shame associated with seeking mental health treatment (Lewis-Schroeder et al., 2018; Rikkers & Lawrence, 2021). Some of these include loss of occupational status or perceptions of being treated differently or certain organisational cultures that discourage disclosure and psychological vulnerability (Marchand et al., 2015). Such stigma could also be internalised, leading to interpretation of mental health difficulties as a sign of weakness and/or or incompetence (Britt & McFadden, 2012; Gulliver, 2019; Haugen, 2017; Hom et al., 2016), especially when the trauma and its sequalae challenges the self-image of stoicism and strength. Further, chronic exposure to violence, severe injuries, and death is an unavoidable

occupational hazard that often violate internal standards of morality (e.g., using lethal force that results in death of a victim, leading to chronic feelings of shame and guilt (Lentz et al., 2021).

Apart from high rates of PTSD, first responders experience high rates of distress, psychiatric comorbidities, alcohol misuse and elevated rates of suicide (Haddock et al., 2012; Pietrzak et al., 2012). Despite this, research into the assessment and treatment of PTSD among first responders, is lacking, with only two studies focused on first responders out of a review of 845 randomised controlled trials of PTSD outcomes (Haugen et al., 2012).

In our study, we aimed to address this knowledge gap by reporting on outcomes from a routine PTSD treatment, delivered to first responders presenting with occupational trauma and a diagnosis of PTSD. Firstly, we established the extent to which shame related symptoms are a feature of the clinical presentation of first responders presenting for treatment. Secondly, we examined the extent to which symptoms of shame are responsive to evidence-based treatment that targets PTSD symptoms. The treatment comprised both group and individual sessions and was based on principles of CPT (Resick et al., 2016; Resick & Schnicke, 1992), Trauma focused cognitive behavioural therapy (TF-CBT) (Ehlers et al., 2005; Kubany et al., 2004; Marks et al., 1998), and PE (Foa et al., 2007). We hypothesised that there would be a significant reduction in both shame and PTSD symptoms, pre-and posttreatment.

Given shame's inexplicable link to PTSD, it is not only an important treatment outcome, but a possible target to facilitate changes in PTSD symptoms. Considering this, we aimed to investigate whether the presence of premorbid shame would influence treatment outcomes. We hypothesised that individuals with higher premorbid shame would also exhibit higher levels of pre and posttreatment PTSD. Further, we also expected that PTSD symptoms posttreatment would be influenced by levels of shame at the start of treatment.

As a final aim, we explored whether changes in shame across treatment were predictive of changes in PTSD symptoms. As this aim was largely exploratory, no a-priori hypotheses were specified.

Method

Procedure

Data were obtained retrospectively from hospital records of patients who attended and completed outpatient treatment at St. John of God Burwood Hospital, a private hospital in Sydney, Australia between 1 January 2020 and 31 December 2022. Available data were scanned, de-identified and entered in Statistical Package for the Social Sciences Version 29 (SPSSV29). Ethical approval was obtained from St. John of God Healthcare, Human Research Ethics Committee (HREC) in Sydney (HREC1869) and was ratified by the University of Technology, Sydney (ETH21-6844). All participants in the study provided consent for de-identified data to be used for the purpose of assessing treatment response and in research for quality assurance. Only patients who attended a trauma specific program (Adult Trauma Program) were included in the analyses (See Supplementary Material, Figure 1).

Adult Trauma Program (ATP)

The ATP is an outpatient treatment program delivered over a 12-week period at a private mental health hospital in Sydney, Australia. The program consisted of twice-weekly group sessions, and one individual therapy session each week. To be eligible for the program, participants were required to be: 1) over 18 years old, 2) hold current Workers Compensation Insurance, 3) have a current diagnosis of PTSD. The exclusion criteria were: 1) current suicidal risk, 2) significant risk of harm to self-and/or others, 3) active psychotic symptoms,

and 4) significant life disruptions (e.g., legal proceedings), which would impact group attendance, and 5) severe substance use (e.g., Alcohol Use Disorder).

The group program consisted of a manualised treatment protocol that integrated key components of CPT (Resick & Schnicke, 1993) and TF-CBT (Ehlers et al., 2005; Kubany et al., 2004; Marks et al., 1998), that focus on: psychoeducation related to PTSD, distress tolerance skills and de-arousal strategies, emotion regulation skills, and maintenance of a healthy lifestyle. Following skills acquisition, the latter half of treatment focused on identifying and challenging distorted negative cognitions and beliefs resulting from traumatic experiences, and correcting overgeneralised beliefs about safety, power/control, and its effects on intimacy and relationships.

Individual treatment sessions consisted of Imaginal Exposure (IE) and In-vivo Exposure (Foa et al., 2007). During these sessions, participants were asked to recount and engage with their trauma memory to facilitate trauma processing, memory reconsolidation, habituation of fear and reduction in avoidant related behaviours.

Participants

Participants consisted of 65 adult patients (52 males and 13 females), aged between 27 to 66 years (M = 46.60 years, SD = 8.66). All participants had a background of occupational trauma (e.g., police, first-responders), had an existing diagnosis of PTSD, and accessed treatment through Workers' Compensation. See demographic details in Table 1. Diagnoses were confirmed by the hospital's treating psychiatrist during intake assessment. Participants were administered a series of self-report measures by their treating psychologist at the start and end of treatment.

Table 1

Demographic Characteristics at Pre-Treatment (N = 65)

	n (%)
Gender	
Male	52 (80%)
Female	13 (20%)
Marital Status[a]	
Single	5 (7.77%)
Married/De-facto relationship	51 (78.46%)
Separated/Divorced	7 (10.77%)
Highest Level of Education	
High school	7 (10.77%)
Trade Certificate	27 (41.54%)
Undergraduate Degree	12 (18.46 %)
Postgraduate Degree	19 (29.23 %)
Healthcare professional support in last four weeks[b]	
General Practitioner	36 (55.38%)
Psychiatrist	44 (67.69%)
Psychologist	58 (89.23%)
Medical Specialist/Other	6 (0.09%)
Psychiatric medication use in past three months[c]	
PTSD	53 (81.54%)
Anxiety	50 (76.92%)
Depression[d]	49 (75.38%)
Alcohol/Drug use	7 (10.77%)

Sleep	48 (73.85%)
Anger	12 (18.46%)
Psychiatric inpatient hospitalisation in last six months[e]	4 (6.15%)

Note. Numbers reflect percentages out of the full sample, unless otherwise stated. [a]Data not available for two patients. [b]This refers to patients seeking care from outpatient services. Patients can endorse more than one treating professional. [c]Patients can endorse use of more than one medication. Data related to types of medications used were not available. [d]Data not available for one patient. [e]Hospitalisation for at least one night.

Self-Report Measures

The PTSD Checklist for DSM-5 (PCL-5)

The PCL-5 (Weathers, Litz, et al., 2013) is a 20-item measure that assesses DSM-5 symptoms of PTSD. The items on the PCL-5 correspond to the diagnostic criteria for PTSD in the DSM-5. The DSM-5 symptom cluster severity scores are obtained by summing the scores for the items within each cluster, i.e., Cluster B – Re-experiencing (items 1-5); Cluster C – Avoidance (Items 6-7); Cluster D – Negative Cognitions and Mood (items 8-14), and Cluster E – Arousal (items 15-20). A total symptom severity score between 0 to 80 can be obtained by summing the scores across the 20-items.

A cut-off score of 33 has been suggested as reflecting a probable diagnosis of PTSD or clinically elevated symptoms (Wortmann et al., 2016). A 5 to 10-point change in PCL-5 total score can be considered a reliable change (e.g., change not due to chance), and a 10 point change represents a clinically meaningful change in PTSD symptoms (Weathers, Litz, et al., 2013). The PCL-5 demonstrates good convergent validity with other PTSD symptom measures (Weathers, Litz, et al., 2013; Wortmann et al., 2016). High levels of internal consistency have been reported for this scale (Cronbach's $\alpha = .93$; Bovin et al., 2016), with similar levels of internal consistency evident in the current study (pre = .88, post = .95).

The Trauma-Related Shame Inventory (TRSI)

The TRSI is a 24-item measure that assesses the cognitive, affective, and behavioural components of trauma related shame (Øktedalen et al., 2014). Respondents rate the extent to which they experience various components of shame on a five-point Likert scale 0 (*Not true of me*) to 4 (*Completely true of me*). The scale consists of both internal and external shame. Internal shame refers to internal sources of shame (e.g., "Because of my traumatic experience, I feel inferior to others"), whilst external shame refers to externally driven shame (e.g., "If others knew what happened to me, they would not like me"). Both subscales can be summed to yield a total trauma-related shame score. The TRSI has demonstrated good psychometric properties (Øktedalen et al., 2014), and strong discriminate validity from the Trauma Related Guilt Inventory (Kubany et al., 1996). Strong reliability levels were reported in a military sample (Cronbach's α = .91 to .96; Zerach et al. 2018), with similar levels of internal consistency evident in the current study (pre = .96, post = .96).

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a commonly used 9-item measure that assesses depression symptom severity according to the DSM-IV (APA, 2000) criteria for current major depressive disorder (MDD) (Kroenke et al., 2001). Respondents rate the extent to which they were bothered by each criterion on a four-point Likert scale 0 (*Not at all*) to 3 (*Nearly every day*) over the past two weeks. A total score of depression severity between 0-27 is obtained by summing all items. A score of 10 or higher is indicative of a probable current diagnosis of MDD (Levis et al., 2019). A 5-point change in PHQ-9 is considered clinically significant change in depression symptoms (Kroenke, 2012; Kroenke et al., 2010). The PHQ-9 is frequently used as a screening tool for depression in a range of hospital settings. It has demonstrated good convergent and discriminant validity with other depression measures (Beard et al., 2016). High levels of internal consistency for the PHQ-9 were found (Cronbach's α = .91; Kroenke

et al., 2001). In the current study, reliability levels were similarly strong (pre = .86, post = .87).

Generalised Anxiety Disorder (GAD-7)

The GAD-7 is a 7-item measure used to screen for DSM-IV (APA, 2000) GAD symptoms (Spitzer et al., 2006). Respondents rate the extent to which they are bothered by symptoms in the past two weeks on a 5-point Likert scale 0 (*Not at all*) to 4 (*Nearly every day*). Items are summed to yield a total anxiety score between 0 and 21. A score of 10 or higher can be used as a screening tool for generalised anxiety and anxiety related disorders, such as panic, social anxiety (Kroenke et al., 2007). A 4-point change in GAD-7 is considered a clinically meaningful change in anxiety scores (Toussaint et al., 2020). Psychometric evaluations of the GAD-7 indicate that it is a reliable and valid measure of GAD symptoms in both psychiatric and general populations (Löwe et al., 2008; Rutter & Brown, 2017). High levels of internal consistency (Cronbach's α = .88) have been reported in a large psychiatric population (n = 1201; Johnson et al., 2019), with similar of internal consistency evident in the current study (pre = .89, post = .89).

Statistical Analyses

Missing Data

Missing data included both item non-response and questionnaires not administered due to clinician nonadherence to the study protocol. Item non-response ranged from 1.5% pre-treatment to 38.5% posttreatment. TRSI had the highest missingness at pre (9.2%) and post-treatment (38.5%). For the main analyses, Multiple Imputation by Chained Equations (MICE) (Azur et al., 2011) was used on item-nonresponses to improve precision of imputation and to relax assumptions regarding distribution of scores. Data was assumed to be Missing at Random (MAR) for the imputation model (Sterne et al., 2009). Sixty imputed

datasets were generated in SPSS V29, using predictive mean matching for continuous variables with fully conditional specification. This number of imputations was used based on the proportion of cases with missing data, 60 imputations should provide reproducible results, i.e. width of CIs within 10% of true value with observed fraction of missing information in our data (Bodner, 2008). Regression models were run on each imputed dataset, and the results were combined using Rubin's rules (Rubin, 2004).

Power Calculation

The initial aim was to recruit a minimum of 100 participants, which would give 0.8 power to detect an effect size of 0.30 (Cohen's *d*) from paired data. The achieved sample size of 65 provided a power of 0.8 to detect an effect size of 0.36.

Descriptive and Correlation Statistics

Descriptive statistics were derived from the non-imputed dataset. Listwise deletion was used for descriptive data. Bivariate correlations of pre-and post-treatment scores were also calculated. Correlations between pre and post treatment scores were calculated using Pearson's bivariate correlation coefficient (*r*). The strength of the correlations was based on Cohen's (1988) conventions to interpret effect size. A correlation co-efficient of .20 represents a weak or small association; a correlation of .05 is a medium or moderate association, and .80 represents a large or strong association.

Main Analyses

The main analyses were conducted on the imputed dataset. To assess treatment response, a paired samples t-test was conducted using the pooled results after multiple imputation to examine the statistical difference scores for pre- and post-treatment scores on the PCL-5 and TRSI. Degrees of freedom were corrected according to (Barnard & Rubin, 1999). Effect size (Cohen's *d*) was calculated using the sample standard deviation of the

mean difference and classified according to Cohen's (1988) definition small ($d = .20$), medium ($d = .50$) and large ($d = .80$).

Regression analysis was performed to determine if pre-treatment PTSD and shame severity were independently associated with treatment response. To examine if pre-treatment shame was associated with pre-treatment PTSD and post-treatment PTSD, the means of pre-treatment PCL-5 and TRSI scores were centred, and an interaction term was created (Kraemer & Blasey, 2004).

To examine the relationship between changes in shame and changes in PTSD across treatment, a correlation of the simple change scores of the variables was initially considered, but not implemented because of the ambiguity of the estimated correlation (Gardner & Neufeld, 1987). To avoid the limitations associated with using raw change scores (Gardner & Neufeld, 1987), a bivariate linear mixed model (Gao et al., 2017) was run using SAS statistical package 9.4. The model included parameters for variables; TRSI and PCL, time (pre-treatment and posttreatment), and an interaction between time and variables (with a random slope). The covariance between the random slopes was estimated to quantify the extent to which changes in TRSI are correlated with changes in PTSD from baseline. The correlation coefficient was derived from the estimated covariance matrix, and the results were combined from the 60 imputed datasets using Rubin's rules (Rubin, 2004).

Results

Descriptive Statistics and Correlations

Table 2 reports the key descriptive statistics for each measure at pre-treatment and post-treatment on the complete dataset before multiple imputation. The proportions of patients who reported clinically significant symptoms at pre-treatment and post-treatment are

also reported. At the start of treatment, a majority (> 80%) of participants exhibited clinically

significant levels of depression, anxiety, and PTSD symptoms.

Correlations between pre and post treatment scores were calculated using Pearson's

bivariate correlation coefficient (r). There was a strong association between pre-treatment

shame and pre-treatment PTSD scores ($r = .68$, $p < .001$). Post-treatment shame and PTSD

scores maintained a moderately strong association ($r = .42$, $p < .001$).

Table 2

Descriptive Statistics of Key Outcome Measures at Pre-treatment and Post-treatment

	Pre-treatment					Post-treatment				
	n	Range	Mean	*SD*	Proportion in the clinical range	*n*	Range	Mean	*SD*	Proportion in the clinical range
Anxiety	64	4-21	14.75	4.61	53 (81.5%)	44	3-21	12.47	4.54	33 (75.0%)
Depression	61	4-26	17.05	5.53	53 (86.9%)	45	2-25	15.22	5.60	38 (84.4%)
Shame[a]	59	0-71	27.10	17.41	-	40	0-70	27.40	15.60	-
PTSD	60	24-79	55.02	11.46	58 (96.7%)	45	12-76	49.29	15.78	37 (82.2%)

Note. Listwise deletion was used to manage missing data. [a]A clinical cut-off score for the TRSI has not been established.

Anxiety = GAD-7; Depression = PHQ-9; Shame = TRSI; PTSD = PCL-5.

Effect of Treatment

Differences on reported PTSD scores on the PCL-5 were statistically significant pre-treatment to post-treatment, $t(49.4) = 4.76$, $p < .001$, and a medium effect was found ($d = -0.65$, 95% CI = -0.92 to -0.38). There were no significant differences between reported shame scores on the TRSI from pre-treatment to post-treatment, $t(54.6) = -1.20$, $p = .88$ ($d = 0.16$; 95% CI = -0.10 to 0.42).

Association Between Pre-treatment Shame and Improvement in PTSD Symptoms

Regression analysis was used to investigate whether pre-treatment shame scores were associated with improvement in PTSD scores across treatment (e.g., post-treatment PTSD controlling for pre-treatment PTSD). When controlling for the presence of pre-treatment PTSD, Pre-treatment shame was not independently associated with post-treatment PTSD scores ($B = 0.13$, $t = 0.98$, $p = 0.33$, 95% CI = -0.13 to 0.39). Pre-treatment shame also did not moderate the relationship between pre-treatment PTSD and post-treatment PTSD scores ($B = 0.00$, $t = .06$, $p = .95$, 95% CI = -0.02 to 0.02).

Association Between Changes in Shame and PTSD Scores

Bivariate Linear Mixed Models were used to analyse the association between the individual change scores on the PCL-5 and TRSI. There was a positive correlation ($r = .52$), however there was no evidence that this association was reliable (Covariance of slopes = 0.20, 95% CI = - 0.06; 0.46, $p = 0.13$).

Post-Hoc Exploratory Analysis

A post-hoc exploratory analysis was run to examine whether changes in shame were associated with changes in different PTSD symptom clusters. Only changes in shame were correlated with the Alternations in Cognition and Mood ($r = .75$) and Hyperarousal ($r = .65$)

subscales, however, there was no evidence that these associations ($p = .11$ and $p = .81$, respectively) were reliable.

Discussion

Beyond fear, shame has been identified as an important post trauma response, associated with (Lopez-Castro et al., 2019; Saraiya & Lopez-Castro, 2016), and predictive of PTSD symptoms (Andrews et al., 2000; Feiring, Taska, & Lewis, 2002; Feiring & Taska, 2005; Uji et al., 2007). Studies investigating shame and PTSD within the treatment context are only just emerging (Harned et al., 2014; Øktedalen et al., 2015; Resick et al., 2008). However, they suggest that shame is not only an important treatment target, but a potential mechanism toward improving treatment outcomes.

The current study aimed to add to the growing body of work by investigating responses of shame and PTSD following routine PTSD treatment among first responders presenting with a background of occupational trauma and a diagnosis of PTSD. First responders are among the most frequently traumatised populations within the community. They experience high rates of PTSD compounded by significant psychiatric comorbidity and clinical distress (Boffa et al., 2017; Haddock et al., 2012; Tak, 2007; Witteveen, 2006). Further, shame may also be an underappreciated affective experience that affects treatment response (Britt & McFadden, 2012; Gulliver, 2019; Haugen, 2017; Hom et al., 2016; Lentz et al., 2021).

It was hypothesised that there would be significant reductions in both PTSD and shame following treatment. We also expected that the presence of pre-treatment shame would both be related to higher PTSD symptoms, and influence treatment outcomes.

As expected, there was a significant reduction in PTSD symptoms from pre-treatment to post-treatment. This was not surprising as the current treatment program uses a trauma focused intervention that has been indicated for PTSD (Watkins et al., 2018). Despite this, the

size of treatment effect did not compare favourably with treatment effects much lower compared to a recent study reporting outcomes in a routine civilian outpatient care sample in Australia (Casey et al., 2022). There are suggestions that compared to civilian populations, first responders have a unique symptom profile characterised by elevated levels of diminished interest, emotional numbing, and social detachment (Bryant, 2021, 2022; Byrne et al., 2017; Graham, 2012; Haugen et al., 2012; Pietrzak et al., 2014). These symptoms may arise as coping strategies to allow first responders to emotionally detach themselves to work effectively within their role (Pietrzak et al., 2012). However, if these strategies become deeply entrenched, they have the potential to inhibit optimal engagement in treatment and predict poor response (Bryant, 2021, 2022; Byrne et al., 2017; Graham, 2012; Haugen et al., 2012; Pietrzak et al., 2014). Thus, additional attention may be needed in addressing these symptoms to optimise treatment and improve outcomes.

Contrary to expectations, there were no significant changes in shame symptoms from pre-treatment to post-treatment. Interestingly, compared to PTSD symptoms, there was a small increase in shame posttreatment. It is also possible that in this sample, shame and PTSD symptoms changed at different rates.

Given that the presence of shame has been associated with unfavourable treatment outcomes (van Minnen et al., 2002), we also investigated whether the presence of premorbid shame was associated with post-treatment PTSD scores, whilst controlling for the effects of pre-treatment PTSD scores. This is a research question of considerable clinical gravitas, as improving our understanding of the pre-treatment client characteristics which predict unfavourable treatment outcomes is important for clinical streaming and tailoring services to be "patient-centered" (Boardman & Dave, 2020; Gask & Coventry, 2012). Considering this, we also investigated whether changes in shame predicted changes in PTSD symptoms.

Although shame was related to both pre and post PTSD scores, contrary to our second hypothesis, pre-treatment shame did not independently predict post-treatment PTSD scores. Additionally, our findings suggest that higher levels of shame at the start of treatment did not influence the relationship between pre-treatment and post-treatment PTSD symptoms. Although shame and PTSD were strongly correlated, it is possible that individual shame experiences may not necessarily be as directly tied to their PTSD symptoms, and thus was not directly influenced by one another.

Given the strong associations between shame and PTSD (Lopez-Castro et al., 2019), we also posited that changes in shame during treatment may be related changes in PTSD (Øktedalen et al., 2015). Based on current results, there is no reliable evidence that changes in shame from pre- to post-treatment are associated with changes in PTSD, which contradicts findings from Øktedalen et al. (2015). Although speculative, it is possible that shame appraisals and symptom profiles among interpersonal survivors within the general population differ to those who have been exposed to occupational trauma. However, investigation into potential differences between the influence of the nature and types of occupational trauma were beyond the scope of the current study.

Conversely, it is possible that, for first responders, the current treatment protocol may not have been robust enough to address shame within this treatment population. If so, an adjunctive or additional follow-up intervention may be needed to promote improvements in shame. Regardless, we cannot rule out a potential effect, and further replication using larger sample sizes is needed to examine these questions with increased statistical power.

Several limitations of the study are worth noting. Firstly, our sample was disproportionately male. There are also differences between male and female first responders. Studies have found gender differences in types of incidents that precipitate PTSD symptoms. For example, women are more likely to experience sexual violence, whilst men exposed to

gun violence such as shooting (Gehrke & Violanti, 2006). Personality characteristics such as attributional styles and coping strategies have also been found to differ between male and females (Andrew et al., 2013). Future research may seek to compare gender differences in terms of trauma exposure, PTSD symptom profiles and how this may influence reports of shame and treatment response.

Secondly, a large proportion of post-treatment data were incomplete. Although multiple imputation was employed to mitigate the effects of missing data, there is still the possibility of bias arising from differential attrition and clerical lapses (administration of incomplete questionnaire batteries). While the use of paper-based questionnaires is common practice in collecting health outcome data, the use of electronic questionnaires may reduce clinician error in questionnaire administration and obviates the need for data entry. Second, the lack of a control group in the present study precludes commentary on improvements in the absence of the intervention and leaves open the possibility that participants may have improved without the intervention. Future studies may seek to use an ethnically appropriate control group, such as those on waitlist for treatment, to assess outcomes more robustly through between-group analyses.

Finally, the current pre-post design does not contain sufficient information to adequately specify individual changes, especially if there are fluctuations in scores across time points. Responses to psychotherapeutic interventions may be influenced by individual characteristics of patients (personality traits, baseline symptomology) (Fleeson, 2001) and characteristics of the group such as the format in which therapy was delivered, or the interaction between both patient and group characteristics. Thus, it is recommended that future studies utilise longitudinal data that can separate the variance related to individual differences (between person) and intra-individual processes of change (within-person), to fully evaluate the theoretical contributions of shame in the treatment of PTSD (Curran &

Bauer, 2011; Curran & Willoughby, 2003; Hoffman & Stawski, 2009; Øktedalen et al., 2015). This can be done through a weekly assessment of symptoms, session to session or through newer experience sampling and ecological momentary assessment approaches, administered outside of treatment (Walls & Schafer, 2006).

Overall, our study is the first to assess responses to shame and PTSD in first responders undergoing routine outpatient PTSD treatment. The results indicate that the existing routine group and individual treatment was not sufficient in ameliorating the trauma-related shame. It also highlighted that changes in shame did not predict changes in PTSD symptoms, indicating that targeting shame may not necessarily influence PTSD treatment responses. However, considering the limitations, further research utilising larger more broad trauma exposed samples to increase statistical power and validate these findings. Nevertheless, our preliminary findings indicate that although shame and PTSD are highly correlated, adjunctive treatments may be needed to effectively reduce shame posttreatment.

Chapter 8. General Discussion

Program of Research

The current program of research extends both theoretical understands of shame, PTSD, and the cognitive antecedents of these. It was also the first to provide a comprehensive overview of how these relationships might extend across time and to clinical populations, using a range of methodologies, cross sectional and prospective designs and clinical real-world data. Across the studies, the influence of important trauma characteristics such as trauma type and trauma history, were also considered.

The first aim of this program of research was to confirm the empirical relationship between shame and PTSD with both a broad shame measure and a trauma specific measure of shame. Study 1 investigated the relationship between shame and PTSD using one of the most widely used shame measures (TOSCA-3; Tangney et al., 2000). It also sought to account for the differential relationship between shame, guilt, and PTSD by investigating the influence of interpersonal trauma type.

Study 2 extended the work of Study 1 by utilising a trauma-specific shame measure (TRSI; Øktedalen et al., 2014). It also investigated whether shame is simply a correlate or is pathogenic in PTSD. The prospective relationship between shame and PTSD was investigated across a 9 month period. The study included participants exposed to traumas across the lifespan and with varying trauma histories, to represent clients seen in clinical practice.

Once the relationship between shame and PTSD was established, the second aim of the program of research was to investigate how shame arises in the context of trauma exposure. Current cognitive theories of PTSD propose that differences in trauma appraisals are responsible for the development and maintenance of PTSD. Drawing from the Cognitive Attributional Theory of Shame (Lewis, 2000; Tracy et al., 2007), chapters 4-6 presented a

series of studies investigating the role of causal attributions as a cognitive antecedent to shame.

A systematic review was conducted in Study 3 to assess the current state of literature investigating the role of causal attributions, shame, and PTSD. Extending on existing work, Study 4 presented the first study to evaluate this relationship in a broad trauma exposed sample. Findings from study 4 were replicated in Study 5, where PTSD diagnoses were established, and symptoms severity quantified, using a gold standard PTSD semi-structured diagnostic interview.

To conclude the program of research, Study 6 investigated the relationship between shame and PTSD in a clinical sample. It also assessed shame's response to routine PTSD treatment and whether the presence of shame influenced treatment outcomes.

This general discussion aims to bring together the key findings arising from the studies. Limitations and strengths of this body of research, along with clinical implications and directions for future research, beyond those discussed in each individual study will also be discussed.

Summary of key findings

The Relationship Between Shame and PTSD

To clarify the relationship between shame and PTSD, it was essential that a validated measure of shame was used. Across five independent samples (Study 1, 2, 4, 5 and 6), shame was consistently associated with PTSD, however trauma *specific* shame had the strongest relationship to PTSD. This finding was also reflected from studies extracted in the systematic review in Study 3.

Shame and Guilt

A first consideration within this program of research was the distinction between shame and guilt, and whether there was a differential relationship with PTSD. Findings from Study 1 indicated that shame, not guilt, was related to PTSD. However, as discussed (Prelude to Chapter 3), the TOSCA-3 (Tangney et al., 2000) does not adequately capture maladaptive aspects of guilt, nor account for the clinical aspects of shame directly related to the aftermath of a traumatic incident.

Considering this, the subsequent studies (Study 2, 4-6) utilised measures that captured the complex cognitive, affective, and behavioural components of shame and guilt (TRSI and TRGI). Using data from Study 2, we replicated the regression model in Study 1 (Appendix 6). We found that shame independently predicted PTSD symptoms when controlling for the effects of trauma exposure, depression, anxiety, and trauma related guilt. However, the findings indicate that there is a significant overlap between trauma-related shame and guilt, noted by the strong relationship between the two. Further, they were both strongly associated with PTSD, and their respective associations were similar in magnitude.

Statistically, although it is possible to observe shame "free" from guilt, Blum (2008) argues that this does not always correspond to how shame operates in the "real world" (Blum, 2008, p. 99). While there are distinct differences between shame and guilt, judgements that relate to specific behaviours may inevitably spill over into appraisals about the whole self, eliciting a simultaneous feeling of shame and guilt (Severino et al., 1987). Thus, the *quantitative* difference between shame and guilt may not always reflect how *qualitatively* similar they both are.[13]

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[13] In Study 2, we did not include guilt as an additional variable in the model as there is likely a direct relationship between the PTSD and guilt, and shame and guilt, which would make it a potential collider (Holmberg & Andersen, 2022; Tönnies et al., 2022) e.g., more

Role of Trauma Type and Trauma History

Interpersonal Trauma

Another point of consideration was whether a distinct traumatic stressor could also influence the relationships between shame and PTSD. Study 1 examined the possibility that shame would be more salient among interpersonal trauma survivors. Participants who had been exposed to at least one interpersonal trauma exposure exhibited both a higher level of trait shame, and endorsed more severe PTSD symptoms, compared to those that did not. Further, interpersonal trauma exposure influenced the effects of shame on PTSD. Similarly, in Study 2, participants who endorsed an interpersonal traumatic event as their worst traumatic stressor, also endorsed higher levels of trauma-related shame, and more severe PTSS compared to guilt. Across both studies, interpersonal trauma was unrelated to both trait characteristics of guilt and trauma-related guilt.

Trauma Load

Exposure to multiple traumas, is a rule not the exception (Kessler et al., 2017). As expected, there was a dose-dependent relationship between the number of traumatic events (trauma load/exposure) and endorsement of PTSD symptoms (Study 1, 5). Further, accumulating traumatic experiences also increased the risk of PTSD, and possibly decreased the likelihood of symptom remission over time (Study 2). This finding has been confirmed in various epidemiological and population-based studies (Brewin et al., 2000; Kolassa et al., 2010; Tortella-Feliu et al., 2019).

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shame causes guilt, and PTSD causes guilt. As pulling these apart robustly can be problematic, we chose not to include guilt in the model.

Considering this, we would also expect that cumulative trauma exposure would also increase one's *propensity* toward making negative self-appraisals, characteristic of trait shame. Interestingly, findings from Study 1 indicate that only a history of interpersonal trauma, not cumulative trauma exposure was related to higher levels of trait shame. It is possible that the assessment of trait shame using hypothetical situations encountered in everyday life was too phenomenologically distinct and unrelated to overall intense shame reactions following traumatic incidents (Beck et al., 2011). It is worth noting however, that in this study, trauma load was captured as a proxy variable that captured the number of types of traumatic events an individual was exposed to rather than the true frequency of traumas across one's lifetime. Nevertheless, findings from Study 2, 4 and 5 also indicated that a higher trauma load was related to endorsement of higher levels of trauma-related shame and guilt, suggesting that on average trauma history does influence individual trauma appraisals and emotional reactions.

Attributions, Shame, and PTSD

Given shame's inextricable link to PTSD, another important question of this program of research was how shame emerges post trauma. Drawing from the Cognitive Attributional Model of Shame (Lewis, 1992; Tracy et al., 2007; Tracy & Robins, 2004, 2006), studies 3-5 aimed to investigate the relationship between causal attributions, shame and PTSD.

Study 3 presented an exhaustive review of published research between 1980-2022. Findings from the review indicated that internal attributions were consistently related to shame and PTSD. However, these studies did not explicitly assess the other causal dimensions of shame, *stability* and *globality* which are key to establishing the attribution-shame link.

To our knowledge, Study 4 was the first to lend empirical support to the Cognitive Attribution Model of Shame (Tracy et al., 2007) within the context of trauma and PTSD. That

is, it investigated whether individuals who endorse higher levels of internal, stable, *and* global causal attributions for their traumatic experiences tended to endorse higher levels of shame and PTSD. The findings also indicated that causal attributions alone are insufficient to cause PTSD. Rather, it is the presence of shame, a consequence of causal attributions that may partially account for this direct relationship. Importantly, this relationship holds regardless of one's trauma history, the nature of one's trauma (interpersonal versus non-interpersonal trauma) and time elapsed since trauma. This finding was replicated in an independent sample (Study 5) where symptoms of PTSD were quantified using a semi-structured diagnostic interview.

Influence of Depression

 Findings from Study 4 indicated that individuals who make internal, stable, and global attributions will endorse higher levels of shame and subsequently experience more severe PTSD symptoms. Although an important cognitive antecedent, such attributions are not unique to shame.

Across studies within this program of research, depression was consistently associated with PTSD. Incidentally, individuals with both PTSD and MDD both show a tendency to interpret events in a negative manner, by catastrophising and blaming themselves (Beck et al., 1988; Dunmore et al., 2001). Further, individuals who hold a negative attributional style; the tendency to attribute negative events due to *internal, stable, and global* causes (negative attributions) demonstrate an increased risk toward developing MDD, indicating that negative attributions are a common transdiagnostic factor in both PTSD and MDD (Angelakis & Nixon, 2015; Gonzalo et al., 2012). Accordingly, findings from Study 4 and 5 found that the relationship between causal attributions, depression and PTSD were all similar in magnitude.

Unsurprisingly, depression also had a consistently strong relationship with shame, suggesting a strong overlap between the two. Several reasons could account for this. Firstly, shame signals a threat of social rejection and thwarts the fundamental need for belongingness (Gilbert, 1997; Gilbert, 2007). In turn, this has consequences for one's psychological functioning which contribute to withdrawal, and possibly lead to depression (Kim et al., 2011). Second, shame could also inadvertently lead to depression by means of increased withdrawal and diminished social contact and activities. Over time, this likely reinforces assumptions related to one's social desirability and strengths core beliefs associated with shame (e.g., worthlessness, unlovability).

Third, shame elicits a negative focus on the self where one is evaluated as fundamentally flawed. In turn, this may elicit ruminative processes known to predict depressive symptoms (Nolen-Hoeksema, 2000; Orth et al., 2006). Such rumination may be maintained by an individual's inability to rectify or change the cause of a situation that is attributed to an intractable and enduring "bad self" (e.g., stable and global characteristics) (Kim et al., 2011). Conversely, guilt, with its specific focus on behaviour, is more easily rectified through reparative actions and thereby counteracting the processes that lead to depression (Joireman, 2004). This distinction is consistent with findings from Study 1, where the measure of guilt (TOSCA-3) which reflected this behavioural tendency, was not related to depression.

Given that attributions are a cognitive vulnerability to both depression and shame, we might expect that individuals who make more negative attributions would also endorse higher levels of shame, especially if they experience higher levels of depression (Abramson et al., 1978). Similarly, shame could also increase one's propensity toward depression, which in turn, increases the severity of PTSS. Contrary to expectations, the presence of depression did not influence any of the proposed relationships. Due to the cross-sectional nature of the study,

the findings only reflect the relationship established at the time of the assessment. Given this

limitation, we were unable to determine which variables assume temporal precedence in any

causal chain. It is still possible, that over time, the relationship between attributions, shame

and PTSD mutually maintains and influence each other. However, this is an avenue for future

research that was beyond the scope of this program of research.

Shame and PTSD: Prospective Relationship and Response to Treatment

A core question of the thesis was whether shame was a trauma response related to

PTSD, or whether it also maintains PTSD over time. Findings from Study 2 confirmed that

over a 9-month period, shame continued to maintain PTSD, even after controlling for trauma

history and time elapsed since trauma. These findings provided further confirmation that

shame may be an important mechanism to target in treatment and to improve treatment

outcomes. However, the relationship between shame and PTSD was small, indicating that

any trauma-related shame intervention might require substantial reductions in shame before

we could expect meaningful changes in PTSD symptoms.

The final study (Study 6) assessed the relationship between shame and PTSD in a

routine treatment setting. Findings from Study 6 indicate that treatment, which combined

group and individual treatment was not sufficient in ameliorating shame. Beyond insufficient

statistical power, several reasons could account for these findings.

Firstly, we speculated that the lack of response may have been due to the nature of

treatment itself. Group treatment consisted of a cognitive based intervention, aimed at

targeting maladaptive trauma-related appraisals and behaviours, whilst individual treatment

utilised exposure-based therapy. Although CPT and TF-CBT do indirectly address shame

related beliefs, within this treatment, the focus on negative appraisals were more broadly

related to PTSD itself (as per the treatment manual). It is possible that, in this cohort, as the target of appraisals was not directly related to shame, it was not adequately addressed.

In terms of individual treatment, PE traditionally focuses on reducing fear through habituation and extinction learning, noting that PE could also indirectly promote emotional processing of all emotions in discussions after imaginal exposure, especially if a patient relives and reports shame-laden events during the process of exposure (Øktedalen et al., 2015). However, findings from Study 6 indicated that changes in shame and PTSD were not associated with each other, suggesting that they both might not respond to PE in the same way or change at the same rate (Pitman et al., 1991; Resick & Schnicke, 1992). It is possible that individual treatment may need to be adapted to accommodate PTSD patients with more complex emotional profiles. For example, Smucker and colleagues (Smucker & Dancu, 1999) developed imagery rescripting and reprocessing therapy (IRRT), an imagery-based CBT treatment aimed at alleviating PTSD symptoms and modifying trauma-related images, and beliefs. It utilises IE to activate the trauma memory and distressing emotions along with imagery rescripting,[14] where the trauma memories are modified to transform the traumatic memory and imagery with one of mastery and coping. This often invokes both fear and non-fear-based emotions, which are then acknowledged and emotionally processed. During this phase, maladaptive secondary beliefs related to shame and guilt are also challenged.

Second, it is possible that individual differences regarding the type and the nature of trauma exposure could account for variations in treatment response. Findings from the preceding studies indicate that specific traumatic stressors, specifically interpersonal trauma exposure, influences the relationship between shame and PTSD. Study 1 and Study 2

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[14] Imagery rescripting is an experiential therapeutic technique that uses imagery and imagination to intervene to directly engage with traumatic memories to help the individual emotionally process the trauma memory and challenge beliefs related to powerlessness, shame, and incompetence (Grunert et al., 2007; Smucker & Dancu, 1999).

discussed the experience of shame from the perspective of survivors of interpersonal trauma

(e.g., sexual and/or physical assault) (Herman, 2011; Lee et al., 2001). However,

interpersonal trauma does not only involve victims of harm, but those perpetrating harm

through acts of commission or omission that are often common experiences within law

enforcement or the military (Griffin et al., 2019; Williamson et al., 2018). In these instances,

perceived moral violations can lead to profound feelings of shame (Litz et al., 2018; Zerach

& Levi-Belz, 2018), especially when they are perceived to challenge internal standards and

threaten an individual's ethical-identity[15] (Harris, 2007; Lewis, 1992; Tangney, 1991;

Tangney, Wagner, & Gramzow, 1992; Tracy & Robins, 2007). For ethical reasons, we had

limited access to patient records and were unable to obtain potentially relevant patient

background information, such as medication, mental health and physical history and details

of their trauma history. Unfortunately, this precluded us from reporting important clinical

characteristics and investigating how both patient and trauma characteristics may have

accounted for, or the lack of treatment response.

Findings from Study 2 indicate that shame might maintain PTSD in the absence of

treatment, and that the relationship was relatively stable across each timepoint. In contrast,

findings from Study 6 indicated that shame was not associated with changes in PTSD over

the course of treatment. The slight increase in shame symptoms posttreatment should not be a

cause for concern, as recovery from PTSD is not linear, and symptoms often fluctuate in its

course (Bryant et al., 2015; Steinert et al., 2015).

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[15] Shame is response to violations of internalised beliefs and standards. If an individual's identity is strongly related to specific values, then violation of these values will have important implications for their sense of who they are. Thus, when an individual is presented with evidence of behaviours that contradicts how they perceive themselves to be, this signals a threat to one's identity that evokes negative self-evaluation, characteristic of shame (Tracy et al., 2007).

Although 3-to-6-month follow-up treatment data was collected, only a small number of participants completed follow-up questionnaires, and there was insufficient data for analysis to allow for assessment of gains following discharge. It is also worth noting that while treatment resulted in a significant reduction of PTSD scores, a substantial proportion of participants[16] (> 80%) still exhibited clinically significant levels of PTSD symptoms. In the absence of follow-up data, it is unclear to what extent shame was associated with residual symptoms after discharge and if so, whether it continued to maintain symptoms at follow-up. This is another important clinical question as ongoing residual symptoms can still contribute to ongoing distress and functional impairment even if the person no longer meets diagnostic threshold (Marshall et al., 2001; Zlotnick et al., 2002). If so, this would indicate the possibility for a follow-up, adjunctive shame specific intervention to alleviate ongoing trauma symptoms (See Goffnett et al., 2020 for a review of shame interventions).

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[16] This calculation is based on the proportion of participants who had complete data at posttreatment ($n = 37$) (Study 6, Table 2).

General Limitations

Beyond the specific limitations that were identified for each study, there are also general limitations that apply across the study series within this program of research.

Generalisability of Findings

Due to challenges with recruitment and resource constraints, it is acknowledged that majority of participants were recruited from Prolific Academic (noting that Study 5 included participants from Prolific and other online forums/groups from Facebook and Reddit), a crowdsourcing platform that compensates users for research participation. Although this limits the generalisability of findings to non-users, there are suggestions that crowdsourcing platforms may be more representative of the internet population than university student populations (Palan & Schitter, 2018).

Nevertheless, some potential threats to data validity are worth noting. Firstly, as monetary compensation is proportionate to the time of study completion, there is a possibility that participants would complete the study too quickly, slowly or select responses without proper consideration (Skitka & Sargis, 2005). To address acquiescence effects and poor-quality responses, we used attention checks embedded within the questionnaires and reverse scored certain items to evaluate response patterns. To ensure that samples across each study were independent, we restricted participants according to their unique Prolific IDs, and analysed participant metadata obtained by Qualtrics to detect duplicate responses. Further, we restricted our participant pool to participants who had high approval ratings.[17] Despite these precautionary measures, we also recognise the possibility that participants may misrepresent

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[17] Approval ratings are based on participants' submissions that were accepted by other researchers on Prolific. This is based on the proportion of approved submissions relative to their rejected submissions. Submissions are rejected if the participants' responses threaten data validity (e.g., completing too fast, skipping questions, failing attention checks)

their demographic details, on sampling criteria to ensure inclusion in the studies. Although these risks are likely to be present across online research, the use of rigorous screening methods (e.g., semi-structured or structured interviews such as the CAPS-5 in Study 5) could help circumvent this issue. Future research may also seek to replicate current findings in more diverse non-clinical and clinical populations using traditional recruitment methods (community flyers) and other online platforms.

Sample Size

The studies in this program of research utilised sample sizes that were consistent with the respective methodologies. Nevertheless, we acknowledge that larger sample sizes would have enhanced statistical power, reduced likelihood of Type I error and provided opportunities for more complex analyses to investigate additional research questions. In Study 2, high attrition rates were noted across each study wave, which is an unfortunate, albeit common challenge of conducting longitudinal research (Caruana et al., 2015) Although multiple imputation was employed to mitigate the effects and preserve statistical power (Asendorpf et al., 2014), there remained a potential risk of bias. Unfortunately, missing data from Study 6 was attributed to clinician error and lack of rigorous protocols within the hospital, thereby undermining the quality of data.

Measurement Issues

Validity and Reliability of Assessment of Trauma Attributions

As indicated in Study 3, much of the attributions research utilised attribution measures that were specific to a trauma type (e.g., sexual assault). However, the program of research aimed to assess the role of trauma-specific attributions, shame, and PTSD in a broad trauma exposed sample. In the absence of well-validated trauma specific attributions measure, we relied on an unvalidated, albeit peer reviewed, published measure by Reiland et al. (2014)

assess causal attributions according to the dimensions of internality, stability and globality. However, the use of single items for each subscale has indeterminant reliability (Wanous & Reichers, 1996), and a multi-item measure is needed to validate findings.

Self-report Measures

Across the studies in the program of research, self-report measures were used to assess psychological constructs of interest. Self-report relies heavily on a respondent's ability to accurately assess themselves and/or a situation. Further, although measures of shame and PTSD focus on current distress, responses for certain constructs (e.g., trauma history) are still subject to recall bias. However, we acknowledge that we were able to utilise the CAPS-5 (Weathers, Blake, et al., 2013a), a gold standard clinical interview in Study 5, which captured both the PTSD diagnosis and assessed symptom levels accordingly. Unfortunately, resource limitations prohibited us from doing the same across all studies. Regardless, self-report measures are still appreciated to be a practical and standardised approach to collecting large scale data (Chan, 2008; Conway & Lance, 2010), and future research may seek to supplement additional, complementary methods to bolster findings.

General Strengths

Aside from the limitations, there were several strengths of this program of research that are worth noting. First, several studies from this program of research have been published in peer review journals, reflecting an original contribution to the field of shame and PTSD.

Second, while the majority of participants were recruited from Prolific Academic, participants were recruited from five independent samples, which yielded a total sample size of $N = 1,143$. Results were consistently replicated across each sample, which increases the generalisability and validity of findings. Further, our liberal inclusion and exclusion criteria allowed us to capitalise on samples with diverse trauma histories, which is more reflective of the trauma survivors within the general population.

Third, various research and clinical skills were demonstrated within this body of work. This includes the administration and interpretation of self-report measures, and the use of a semi-structured diagnostic interview to increase the reliability of reported PTSD symptoms.

Finally, the program of research used a variety of research methodologies to answer the relevant research questions. This included cross sectional, prospective and the use of real world, clinical data. Despite the limitations associated with Study 6, the data obtained reflects real world data. Real world data is defined as what happens in normal routine clinical practice (McDonald et al., 2016; The Association of the British Pharmaceutical Industry, 2011). We acknowledge that RCTs remain the gold standard way to measure a particular intervention of treatment. However, clinical data obtained from routine setting provides vital information for patients, clinicians, and broader healthcare systems beyond those obtained in tightly controlled research settings. Therefore, data obtained from real world settings not only reflect outcomes, but helps to inform processes to improve methodological rigor in these settings (Blonde et al., 2018).

Directions for Future Research

Considering the current findings from this program of research, several avenues for future research could be considered. First, development of a psychometrically validated, multi-item causal attributions measure is needed to validate findings from Studies 4 and 5. Future research may also seek to utilise multimethod assessments to mitigate the limitations of self-report measures. The added use of qualitative data or a mixed methods approach could be a useful way to provide a more meaningful interpretation of research findings and phenomena of interest (Teddlie & Tashakkori, 2003). Qualitative research can provide rich and detailed descriptions of experiences embedded in real world contexts, promoting a better understanding of one's *lived experience* (Colaizzi, 1978; Creswell, 2007; Frechette et al., 2020; Geertz, 1973). This has relevance in trauma research, where differences in how people interpret and attribute meaning to their experiences will impact their recovery and how they might respond to treatment. Such information can be used to guide clinical assessments, clinical formulations, treatment delivery, which translates to improvements in treatment outcomes (Neubauer et al., 2019).

Second, self-report measures not only rely on a respondent's ability to identify their emotional states, but also their *willingness* to disclose such experiences. As discussed in Chapter 1, shame is a painful emotion that signals a threat toward an individual's sense of belonging and undermines their safety within close relationships (Taylor, 2015). It also strikes at the core of one's identity, prompting individuals to question their own sense of self-worth. This makes shame both a painful and highly aversive emotion, leading to fear of shame itself; an internal threat that needs to be avoided (Saraiya & Lopez-Castro, 2016). Lewis (1971) described this as bypassed or unacknowledged shame that is repressed or operate outside one's conscious awareness. In the attempt to control and avoid feelings of shame, individuals may externalise their distress through anger, or internalise it by

withdrawing, leading to depression.[18] Thus, shame that evades explicit awareness altogether

or manifest as other emotions may result in underreporting and go unacknowledged.

Therefore, paradigms that assess implicit shame processing could provide a means to

accurately capture the presence of subconscious or repressed shame (Bockers et al., 2016;

Sippel & Marshall, 2011). Future research may seek to integrate both implicit and explicit

measures of shame processing to obtain a more accurate representation of shame.

Third, empirical data investigating the role of shame and PTSD within treatment

remains the largest gap within the literature. It is recommended that further work is

undertaken to determine the extent to which shame responds to existing routine PTSD

treatment and to compare the efficacy and effectiveness with other adjunctive non trauma

focused therapeutic modalities.

Overall, the goal of research is to establish empirically validated theoretical

assumptions, that can be translated into clinical practice. The TRSI (Øktedalen et al., 2014),

may be a useful tool for assessing trauma-related shame in clinical practice. As a final

recommendation, future research may seek to establish an appropriate cut-off score that

indicates both reliable change (e.g., change not due to chance) and clinically significant

change. This provides a minimum threshold for researchers and clinicians determine response

to treatment, and whether the improvement is not only statistically significant, but *clinically*

meaningful (Armijo-Olivo, 2018; Sharma, 2021).

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[18] The Compass of Shame proposed by Nathanson (1987, 1992) asserts that
individuals will attempt to defend themselves against feelings of shame through four primary
coping strategies; "attacking other," "attack the self," "withdrawal," and "avoidance". These
coping styles correspond to behaviours such as aggression, depression, isolation, and
addiction, respectively (Webb, 2003, 2010).

General Clinical Implications

The results of this research program have important clinical implications for the ongoing assessment and psychological management of PTSD. Results across all six studies consistently highlighted that shame is not only inextricably linked to trauma and its sequalae, but also predicts ongoing PTSS, even up to 10 years post trauma exposure. Together, findings highlight that shame is part of the constellation of negative emotions experienced by trauma survivors.

It is recommended that, during the initial stages of treatment, clinicians should be mindful of the presence of shame and assess for it accordingly. Due to their strong conceptual overlap, shame is often mistaken for guilt. However, shame is theoretically distinct from guilt in terms of their focus of evaluation (self-versus behaviour) and their action tendencies (withdraw versus approach). Clinicians are encouraged to familiarise themselves with the subtle distinctions (Blum, 2008; Lewis, 1971; Lewis, 1992; Lewis, 2003; Miceli & Castelfranchi, 2018; Tracy et al., 2007) between shame and guilt, as failure to distinguish the two can lead to a neglect of shame as a core clinical problem (Capps, 1993; Konstam et al., 2001; Tangney & Dearing, 2002). Although shame and guilt are likely to occur together in clients, reflecting on their differences provides a means for determining whether shame or guilt is the dominant emotion, to assist with clinical formulation and formulating appropriate treatment strategies (Parker & Thomas, 2009).

With shame-laden guilt, appraisals of responsibility are not only ascribed to one's behaviour, but also to their entire self. Thus, behaviour change strategies such as seeking reparation and forgiveness for one's actions may not be sufficient in alleviating guilt, especially if the individual continues to blame core aspects of their self.

It is also recommended that a thorough assessment of trauma history, exposure to certain trauma types such as relational trauma, and personality characteristics (e.g., shame

proneness) is conducted. Further, early exposure to certain traumatic stressors, such as those within the relational context can lay the foundations for negative core beliefs (e.g., worthlessness) that increase with the tendency to interpret situations more negatively and make negative self-appraisals, characteristic of trait shame.

In certain instances, guilt may arise even in the absence of perceived responsibility (e.g., survivor guilt; Murray et al., 2021), which is then reinforced by pre-existing shame, characterised by negative core beliefs such as perceived worthlessness or inadequacy. For example, an individual who survives an accident might recognise that there was nothing they could have done to prevent the death of another, however, continue to experience immense guilt, especially if they interpret their survival as unfair because they are less worthy than others (Murray et al., 2021; Pethania et al., 2018).

Further, when shame is more dominant than guilt, individuals may be more motivated to conceal wrongdoing due to negative self-evaluation, and possible heightened sensitivity toward external judgement from the clinician. Such expectations can limit disclosure and thus affect the client's ability to benefit from therapeutic interventions (Gilbert et al., 1994; Parker & Thomas, 2009). In such cases, experiences of the self rather than actions become the focus of intervention to help the individual separate the self from behaviour.

Clients may benefit from a range of cognitive and emotion focused strategies to reduce shame related distress, including self-compassion, and cognitive interventions. Self-compassion can be considered an effective antidote to shame (Braehler & Neff, 2020) as it entails treating oneself without judgement and criticism. Self-compassion focused therapies (Gilbert & Procter, 2006; Neff, 2003; Neff & Germer, 2013) aim to promote feelings of kindness, common humanity and mindfulness, which can replace feelings of self-blame, isolation and avoidance. In doing so, it could help clients foster empathy toward their own

suffering, cultivate self-forgiveness, and alleviate excessive self-condemnation (Leach, 2017).

Cognitive based interventions aimed at targeting negative trauma appraisals are also recommended to target shame cognitions (e.g., CPT; Resick & Schnicke, 1992). Cognitive conceptualisations of PTSD and shame suggest that shame is evoked through a cognitive-evaluative process (Ehlers & Clark, 2000; Lewis, 2003; Tracy & Robins, 2004, 2006). Results from Study 4 and 5 indicate that attributions of causality are an important component to shame, specifically when they are ascribed to internal and stable attributes that permeate the entire self. Beyond attributions of causality, uncovering appraisals about the trauma and its sequelae along with the implications for one's identity (e.g., finding oneself undesirable due to the traumatic event or weak because of PTSS) may also highlight the presence of shame. More specifically, if the individual appraises their reactions at the time of the traumatic event, subsequent posttraumatic symptoms, or alterations in their sense of identity, the culmination of these appraisals can also lead to attributions of self-blame (Dunmore et al., 2001; Ehlers & Clark, 2000).

According to Janoff-Bulman (2002), the experience of traumatic events challenges assumptions about oneself as competent and the world, as safe and trustworthy. If these shattered beliefs have not been repaired, subsequent trauma experiences may more readily activate feelings of shame as one's self-worth becomes more fragile (Platt & Freyd, 2012). Following this, an individual might start to internalise blame and appraise themselves more negatively because of their experiences, even if they bear no responsibility.

Overall, therapists should aim to recognize the presence of shame, regardless of the type of trauma exposure and see it as not only a potential obstacle to the therapeutic relationship and process, but a mechanism that can promote healing and recovery. Shame is a painful and highly aversive emotion that signals a threat toward exposure of one's perceived

inadequacies, prompting a desire to hide and withdraw (Lewis, 1971; Lewis, 2003). Clients who experience intense levels of shame may find it difficult to develop a strong therapeutic alliance with their therapist, due to concerns about their undesirability (Black et al., 2013; Macdonald & Morley, 2001). This is concerning as the therapeutic alliance is an important predictor of therapeutic success (Martin et al., 2000). Unacknowledged shame can lead to avoidance, a hallmark feature of PTSD that inhibit optimal engagement in treatment, stifle therapeutic gains and lead to drop out (Alpert et al., 2020).

Beyond specific interventions, it is also possible to address shame indirectly using the therapeutic relationship. By adopting an acceptance, non-judgemental stance (e.g., unconditional positive regard), clinicians can also help alleviate feelings of shame, reduce defensive behaviours, and bolster a client's capacity to trust, to help them engage in therapy more effectively (Brill & Nahmani, 2017).

It is recommended that clinicians routinely assess shame throughout treatment. Beyond assessing treatment outcomes, it can also help better inform clinical decisions for individualising treatment. For example, at the start of treatment, if shame leads to a reduction in PTSD symptoms (Øktedalen et al., 2015), this might suggest that shame could be the primary target before commencing trauma focused treatment (e.g., exposure-based therapy). Conversely, if a reduction in PTSD symptoms led to a reduction in shame, alleviation of PTSD symptoms would be the primary goal. If clinicians are concerned that repeated administration of lengthy assessment measures can place an undue burden on participants, a 10-item TRSI-short form scale has since been released and psychometrically validated (Grau et al., 2022). As the authors suggest, this measure is a quick and efficient tool that can be provided on a regular basis to monitor symptoms across treatment.

Concluding Remarks

Trauma exposure is an unfortunate, albeit ubiquitous experience. It elicits a myriad of emotional responses that has a profound impact on both the physical and mental wellbeing of the individual. By focusing on shame, this program of research aimed to focus on an important feature of PTSD that predicts and maintains symptomology. It provided a comprehensive overview of how these relationships might extend across time and to clinical populations, using a range of methodologies, cross sectional and prospective designs and clinical real-world data. Further, this research program offered insight into the cognitive mechanisms that underlie shame and enriched our conceptualisations of shame. It bridged one of the largest gaps in the literature by investigating whether shame maintains PTSD in both the absence and presence of treatment. Overall, the findings from this program of research add to the growing literature seeking to treat PTSD more effectively through the lens of shame. It is hoped that by drawing on the clinical implications and considerations for future research outlined in this program of research that researchers and clinicians can continue to refine how they conceptualise, understand, and treat individuals suffering with PTSD.

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Appendices

Appendix 1. Study 2 – Supplementary Material

Table 1

Trauma Exposure Across Different Trauma Types[a]

Trauma Type	*n* (%)
Disaster	103 (58.52%)
Fire or explosion	105 (59.66%)
Transportation accident	146 (82.95%)
Serious accident at home, work, recreational activity	72 (40.91%)
Toxic Substance	56 (31.82%)
Physical Assault	132 (75.00%)
Assault with a weapon	86 (48.86%)
Sexual Assault (rape, attempted, perform sexual act through force/threat of harm)	110 (62.5%)
Other unwanted of uncomfortable sexual experience	113 (64.2%)
Combat and/or warzones	53 (30.11%)
Captivity	37 (21.02%)
Life-threatening illness or injury	127 (72.16%)
Severe human suffering	67 (38.07%)
Sudden violent death (e.g., homicide, suicide)	91 (51.70%)
Sudden accidental death	80 (45.45%)
Serious injury, harm, or death you caused someone else	28 (15.91%)
Any other very stressful event or experience	125 (71.02%)

Note. N = 176.

[a]Numbers reflect percentages out of full sample and are not independent; participants can endorse exposure to more than one trauma type.

Table 2

Descriptive Statistics and Correlations Between Key Variables at Baseline

	M (SD)	Range	1	2	3	4	5	6	7	8	9
1. Treatment	.31 (.46)	0-1	-	.11	-.03	.07	.23**	.21**	.39**	.31**	.29**
2. Type	.41 (.49)	0-1		-	-.01	.37**	.34**	.05	.29**	.17*	.23**
3. Exposure	8.70 (4.37)	1-17			-	-.08	.25**	.22**	.23**	.15*	.28**
4. Years	11.30 (11.0)	.02-60				-	.09	.06	.03	.01	.06
5. Shame	11.57 (14.52)	0-66					-	.44**	.57**	.43**	.68**
6. Guilt	5.66 (1.21)	3.49-8.46						-	.46**	.48**	.67**
7. Depression	9.18 (7.25)	0-27							-	.78**	.68**
8. Anxiety	15.25 (6.09)	7-28								-	.61**
9. PTSD	28.53 (18.53)	0-77									-

Note. N = 176.

Treatment = Current pharmacological and/or mental health treatment; Type = Reference trauma type (1 = interpersonal, 0 = non-interpersonal);

Exposure = Trauma history; Years = Time since reference trauma in years; Shame = Posttraumatic Shame; Depression = Depression symptoms;

PTSD = posttraumatic stress disorder symptoms. * p < .05. ** p < .001

Appendix 2. Study 3 – Supplementary Material

Table 1

Quality Appraisal of Included Cross-Sectional Studies (n = 6)

Study		Criteria	Yes	No	Unclear	Not applicable
Alix et al. (2017)	1.	Were the criteria for inclusion in the sample clearly defined?		X		
	2.	Were the study subjects and the setting described in detail?	X			
	3.	Was the exposure measured in a valid and reliable way?	X			
	4.	Were objective, standard criteria used for measurement of the condition?	X			
	5.	Were confounding factors identified?	X			
	6.	Were strategies to deal with confounding factors stated?			X	
	7.	Were the outcomes measured in a valid and reliable way?	X			
	8.	Was appropriate statistical analysis used?		X		
Bhuptani et al. (2021)	1.	Were the criteria for inclusion in the sample clearly defined?		X		
	2.	Were the study subjects and the setting described in detail?	X			
	3.	Was the exposure measured in a valid and reliable way?	X			

			X (col A)	X (col B)
	4.	Were objective, standard criteria used for measurement of the condition?	X	
	5.	Were confounding factors identified?	X	
	6.	Were strategies to deal with confounding factors stated?	X	
	7.	Were the outcomes measured in a valid and reliable way?	X	
	8.	Was appropriate statistical analysis used?	X	
Carretta et al. (2020)	1.	Were the criteria for inclusion in the sample clearly defined?		X
	2.	Were the study subjects and the setting described in detail?	X	
	3.	Was the exposure measured in a valid and reliable way?	X	
	4.	Were objective, standard criteria used for measurement of the condition?	X	
	5.	Were confounding factors identified?	X	
	6.	Were strategies to deal with confounding factors stated?	X	
	7.	Were the outcomes measured in a valid and reliable way?	X	
	8.	Was appropriate statistical analysis used?	X	
Uji et al. (2007)	1.	Were the criteria for inclusion in the sample clearly defined?		X
	2.	Were the study subjects and the setting described in detail?		X

Study		Question			
	3.	Was the exposure measured in a valid and reliable way?			X
	4.	Were objective, standard criteria used for measurement of the condition?	X		
	5.	Were confounding factors identified?	X		
	6.	Were strategies to deal with confounding factors stated?		X	
	7.	Were the outcomes measured in a valid and reliable way?	X		
	8.	Was appropriate statistical analysis used?	X		
Wojcik et al. (2022)	1.	Were the criteria for inclusion in the sample clearly defined?		X	
	2.	Were the study subjects and the setting described in detail?	X		
	3.	Was the exposure measured in a valid and reliable way?	X		
	4.	Were objective, standard criteria used for measurement of the condition?	X		
	5.	Were confounding factors identified?	X		
	6.	Were strategies to deal with confounding factors stated?	X		
	7.	Were the outcomes measured in a valid and reliable way?	X		
	8.	Was appropriate statistical analysis used?	X		
Zerach et al. (2017)	1.	Were the criteria for inclusion in the sample clearly defined?	X		

2.	Were the study subjects and the setting described in detail?	X
3.	Was the exposure measured in a valid and reliable way?	X
4.	Were objective, standard criteria used for measurement of the condition?	X
5.	Were confounding factors identified?	X
6.	Were strategies to deal with confounding factors stated?	X
7.	Were the outcomes measured in a valid and reliable way?	X
8.	Was appropriate statistical analysis used?	X

Table 2

Quality Appraisal of Included Cohort Studies (n = 2)

Study		Criteria	Yes	No	Unclear	Not applicable
Alix et al. (2020)	1	Were the two groups similar and recruited from the same population?				X
	2	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	X			
	3	Was the exposure measured in a valid and reliable way?	X			
	4	Were confounding factors identified?	X			
	5	Were strategies to deal with confounding factors stated?			X	
	6	Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?				X
	7	Were the outcomes measured in a valid and reliable way?	X			
	8	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	X			
	9	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?			X	

Study	#	Question	Col1	Col2	Col3
	10	Were strategies to address incomplete follow up utilized?		X	
	11	Was appropriate statistical analysis used?	X		
Feiring et al. (2002)	1	Were the two groups similar and recruited from the same population?	X		
	2	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	X		
	3	Was the exposure measured in a valid and reliable way?	X		
	4	Were confounding factors identified?	X		
	5	Were strategies to deal with confounding factors stated?	X		
	6	Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?			X
	7	Were the outcomes measured in a valid and reliable way?	X		
	8	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	X		
	9	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	X		
	10	Were strategies to address incomplete follow up utilized?	X		

| 11 | Was appropriate statistical analysis used? | X |

Appendix 3. Study 4 – Supplementary Material

Figure 1

The Relationship Between Internal Attributions and PTSD Symptom Severity Mediated by

Trauma-Related Shame

a: b = 1.58, β = .14, *SE* = .33
95% CI [.93 to 2.23]

b: b = .57, β = .47, *SE* = .05,
95% CI [.48 to .66]

Trauma related shame

c: b = 1.50 β = .11, *SE* = .43,
95% CI [.65 to 2.35]

Internal Attributions

PTSD Symptom Severity

c': b = .60, β = .04, *SE* = .40,
95% CI [-.18 to 1.38]
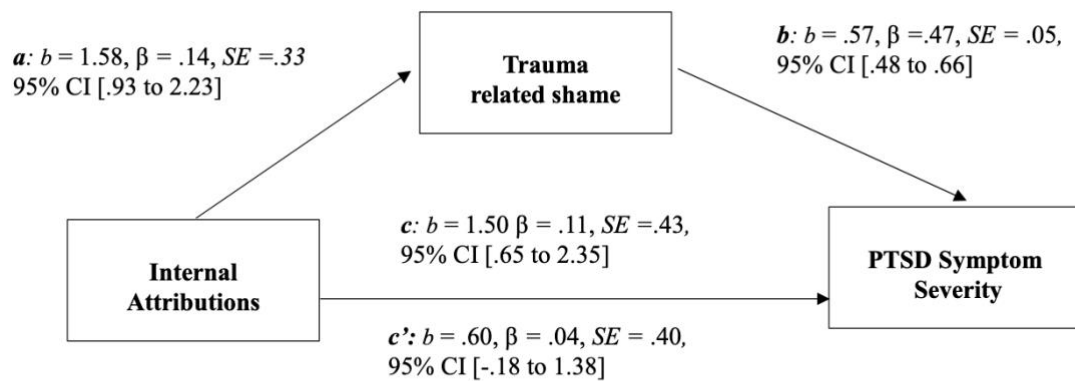
Note. c = total effect; c' = direct effect; *b* = non-standardised regression coefficient; β =

standardised regression coefficient; *SE* = standard error; *CI* = confidence interval.

Indirect effect = 95%CI [.53 to 1.30].

Figure 2

The Relationship Between Stable Attributions and PTSD Symptom Severity Mediated by
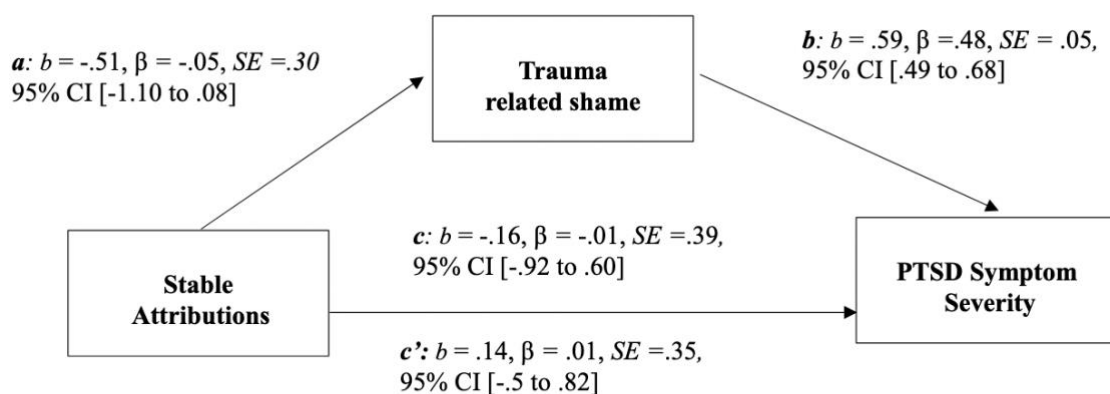
Trauma-Related Shame

a: b = -.51, β = -.05, *SE* = .30
95% CI [-1.10 to .08]

b: b = .59, β = .48, *SE* = .05,
95% CI [.49 to .68]

Trauma related shame

c: b = -.16, β = -.01, *SE* = .39,
95% CI [-.92 to .60]

Stable Attributions

PTSD Symptom Severity

c': b = .14, β = .01, *SE* = .35,
95% CI [-.5 to .82]

Note. c = total effect; c' = direct effect; *b* = non-standardised regression coefficient; β =

standardised regression coefficient; *SE* = standard error; *CI* = confidence interval.

Indirect effect = 95%CI [-.65 to .03].

Figure 3

The Relationship Between Global Attributions and PTSD Symptom Severity Mediated by
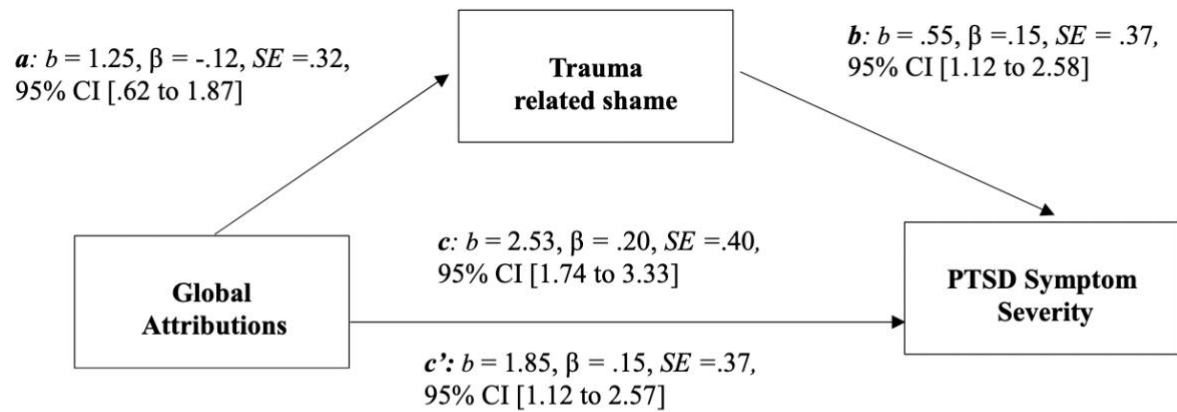
Trauma-Related Shame

a: b = 1.25, β = -.12, SE =.32, 95% CI [.62 to 1.87]

Trauma related shame

b: b = .55, β =.15, SE = .37, 95% CI [1.12 to 2.58]

c: b = 2.53, β = .20, SE =.40, 95% CI [1.74 to 3.33]

Global Attributions

PTSD Symptom Severity

c': b = 1.85, β = .15, SE =.37, 95% CI [1.12 to 2.57]

Note. c = total effect; c' = direct effect; *b* = non-standardised regression coefficient; β =

standardised regression coefficient; *SE* = standard error; *CI* = confidence interval.

Indirect effect = 95%CI [.32 to 1.10].

Appendix 4. Study 5 – Supplementary Material

Our primary mediation model indicated that shame mediates the relationship between trauma-related causal attributions and PTSD. On the basis that internal, stable, and global attributions are also a cognitive vulnerability to depression, we assessed the potential mediating effect of both depression and shame on trauma-related causal attributions and PTSD, in a parallel mediation model (PROCESS Model 6; Hayes, 2013). The parallel model tests the role of each mediation while accounting for shared variation between mediators. Although mediators may be correlated, the causal relationship between them is not considered in this model. The interested reader is referred to Supplementary Figure 1. After the mediators (depression and shame) were included in the model, the direct effect between Trauma related causal attributions fell to non-significance. All indirect effects were significantly different from zero.

Figure 1

Parallel Mediation Model
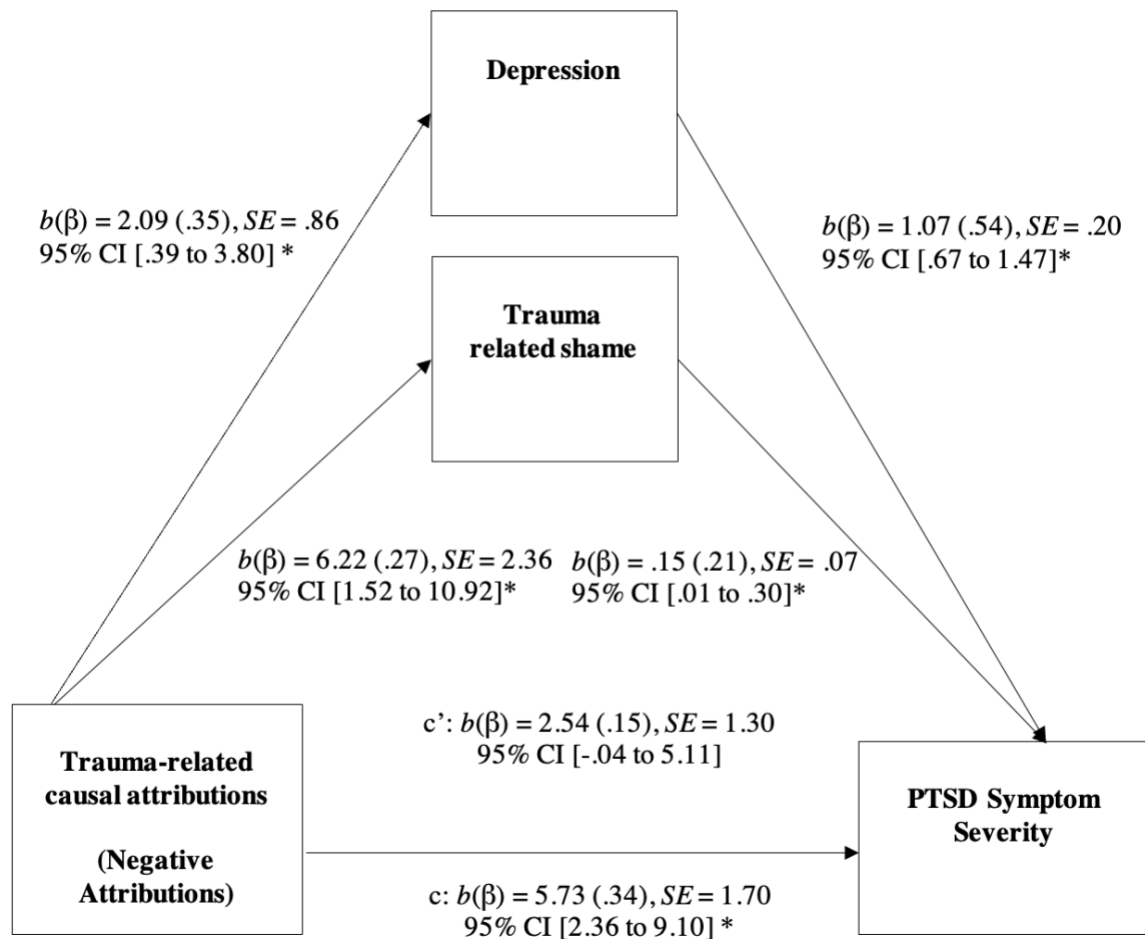
Note. *N* = 87. **p* < .05.

The significant indirect effects were obtained based on bias-corrected bootstrap confidence

interval (CI) based on 5,000 bootstrap iterations. Time since trauma and Trauma Load were

entered as covariates. The total effect of negative attributions on PTSD symptom severity was

significant, $F(3,83) = 6.53$, $p <.001$, with 19% of variance explained. Depression and Trauma-

related shame accounted for 40% and 17% of variance of PTSD, respectively. All indirect

effects were significantly different from zero: Negative Attributions -> Depression -> PTSD,

95% CI [.43 to 4.39] and Negative Attributions -> Shame -> PTSD, 95% CI [.02 to 2.47].

Appendix 5. Study 6 – Supplementary Material

Figure 1

Flowchart Identifying Included Records

```
                    ┌──────────────────────────────────────┐
                    │   All patient group records (2021-2022)│
                    │                                        │
                    │              (n = 255)                 │
                    └──────────────────────────────────────┘
                                     │
           ┌─────────────────────────┴─────────────────────────┐
           │                                                    │
┌──────────────────────────┐              ┌──────────────────────────┐
│                          │              │  Records excluded:       │
│                          │              │                          │
│                          │              │  • No group files (n = 4)│
│ Patient records obtained │              │                          │
│ and scanned electronically│────────────▶│  • Electronic            │
│                          │              │    duplicates (n = 31)   │
│       (n = 234)          │              │                          │
│                          │              │  • Records not clearly   │
│                          │              │    dated (n = 17)        │
└──────────────────────────┘              └──────────────────────────┘
           │                                          │
           │                                          ▼
┌──────────────────────────┐              ┌──────────────────────────┐
│                          │              │  Records excluded:       │
│ Records entered after    │              │                          │
│ electronic duplicates    │────────────▶│                          │
│ identified and removed   │              │                          │
│                          │              │  • Non-trauma focused    │
│       (n = 217)          │              │                          │
└──────────────────────────┘              └──────────────────────────┘
           │                                          │
           │                                          ▼
┌──────────────────────────┐              ┌──────────────────────────┐
│                          │              │  Records excluded:       │
│                          │              │                          │
│ Records identified       │────────────▶│  • No shame measure      │
│ (n = 82)                 │              │    administered at pre- or│
│                          │              │    post-treatment (n = 17)│
└──────────────────────────┘              └──────────────────────────┘
           │
           ▼
┌──────────────────────────┐
│ Final sample (n = 65)    │
└──────────────────────────┘
```

Appendix 6. Chapter 8 – Supplementary Material

Using data from Study 2, Multiple linear regression was performed to assess the independent

relationship between shame and PTSD symptoms, after controlling for the effects of guilt.

Considering high rates of comorbidity between depression, anxiety, and PTSD (Campbell et

al., 2007; Price et al., 2019), the effects of these symptoms were also controlled for. The

potential effect of cumulative trauma; trauma load was also entered as covariates.

Table 1

Multiple Linear Regression Analyses Predicting PTSD Symptom Severity

	B	*β*	*SE*	95%CI		*t*	*p*
				LL	UL		
Depression	.74	.08	.29	.38	1.10	4.09	< .001
Anxiety	.24	.29	.20	-.16	.63	1.17	.24
Exposure	.06	.29	.12	-.18	.31	.52	.61
Guilt	5.87	.39	.73	4.43	7.31	8.03	< .001
Shame	.36	.28	.07	.23	.49	5.37	< .001

Note. The overall model was significant, $F(5,170) = 84.09$, $p < .001$, explaining 71.2% of

variance in PTSD symptoms.

Depression = PHQ-9; Anxiety = GAD-7; Exposure = Cumulative trauma load according to

the LEC; Guilt = TRGI; Shame = TRSI