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UNDERSTANDING PTSD, AGGRESSION, AND SHAME AMONG POST-9/11 VETERANS

by

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A Thesis

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

Major: Psychology

The University of Memphis

August 2019

Abstract

Elevated aggression is frequently found among individuals with posttraumatic stress disorder (PTSD). PTSD and combat exposure alone do not explain the reliable finding of heightened aggression among trauma-exposed veterans. Shame may be an important affective feature in this relationship. The present study examined the role of shame from a social hierarchy perspective in a sample of 52 combat veterans from the post-9/11 era. Correlational analyses indicated positive relations between shame, PTSD, and aggression. Trait shame was found to mediate between PTSD severity and physical aggression, but not other forms of aggression. For veterans within the context of a hierarchical military culture, separation from the military and diagnosis of PTSD may be salient markers of social loss and exclusion. Aggression may operate to reduce the negative affective experience associated with shame and to regain social standing. Findings implicate shame as a pivotal emotional component in the relationship between PTSD and aggression.

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The risk for aggression and violence among individuals with posttraumatic stress disorder (PTSD) has become increasingly salient among Western societies in the wake of the Global War on Terror, as news highlights and popular media have brought attention to narratives of violent trauma reactions among combat veterans exposed to the horrors of war. Although these stories are frequently sensationalized, a growing body of scientific work has demonstrated a link between PTSD and aggression among military and civilian samples alike. Nevertheless, most individuals with PTSD, including veterans, are never violent or dangerous (Norman, Elbogen, & Schnurr, 2017). Still, a significant minority of veterans with PTSD report clinically distressing and impairing levels of anger and aggression (Corrigan & Watson, 2005; Elbogen, Johnson, Wagner, Sullivan, Taft, & Beckham, 2014; MacManus et al., 2013). Recent research has begun to consider the potential role of moral or self-conscious emotions, such as shame, embarrassment, and guilt (Tangney, Stuewig, & Mashek, 2007), in disentangling the complex clinical presentation of increased aggression and violence among those with PTSD. Shame, in particular, may be an important element of post-trauma reactions, as evidenced by its recent inclusion in the updated 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* criteria for PTSD (American Psychological Association, 2013).

Elevated levels of aggression are consistently found among individuals with PTSD (Byrne & Riggs, 1996; Moretti, Osbuth, Odgers, Reebye; 2006; Orth & Wieland, 2006) and are evidenced across the developmental lifespan, following different trauma types, and among different genders. For example, Moretti and colleagues (2006) found that youth aged 13 to 18 who had witnessed parental interpersonal violence (IPV) were more aggressive than their non-exposed peers, and this relationship between witnessing parental IPV and enacting aggressive behavior was stronger among children who met criteria for PTSD using a diagnostic interview,

suggesting that a diagnosis of PTSD confers additional risk for aggression above and beyond modeling effects. This relationship persists into young adulthood, such that male college students reporting symptoms of PTSD also report higher levels of aggressive and violent behavior than men who were exposed to a trauma but who denied symptoms of PTSD (Jakupcak & Tull, 2005), and is also reliably found among older adults with PTSD (e.g. Bell & Orcutt, 2009; Orth and Wieland, 2009). Taft and colleagues (2009) demonstrated similar results among women, such that PTSD symptoms were associated with a higher likelihood of aggression perpetration among female flood victims. Similarly, Kirby and colleagues (2012) found higher rates of intimate partner violence perpetration and general aggression as measured by the Personality Assessment Inventory (PAI; Morey, 1991) among women with PTSD compared to women who did not meet criteria for a diagnosis on the Clinician Administered PTSD Scale (CAPS: Blake et al., 1995). These relational patterns between PTSD and aggression are replicated not only in cross-sectional studies, but also using laboratory-based paradigms of aggression, in which those reporting greater symptoms of PTSD were more likely to engage in aggressive responding on the point-subtraction aggression paradigm (Kivisto, Moore, Elkins, & Rhatigan, 2009). Nevertheless, although a strong body of literature reliably indicates that a meaningful and clinically relevant relationship between PTSD and aggression exists, the mechanisms by which these variables are linked remains unclear.

Accounting for Aggression within PTSD Profiles

Some researchers have considered whether different PTSD symptom profiles are associated with a greater likelihood of aggressive behavior, theorizing that certain symptom domains within PTSD may confer more or less vulnerability to aggression perpetration. For example, Taft and colleagues (2007) found that among male Vietnam veterans, hyperarousal

symptoms, compared to the other PTSD symptom clusters, were most strongly related to aggression, whereas avoidance and numbing symptoms were inversely associated with aggressive behavior. Moreover, re-experiencing symptoms were also related to aggression, specifically through their association with physiological reactivity and alcohol problems. Others have replicated this finding to varying degrees: for example, among post-9/11 veterans with PTSD, Hellmuth and colleagues (2012), using path analysis, also found a strong relationship between hyperarousal and aggression, but only indirectly through trait anger. On the other hand, this study found that numbing symptoms were positively associated with aggression (also indirectly through trait anger), and re-experiencing was directly related to aggressive behavior. Alternatively, Kivisto and colleagues (2009) did not find a relationship between hyperarousal and aggression in college students and found the strongest correlations with aggression among re-experiencing and avoidance and numbing symptoms. These disparate findings may be accounted for by differences in aggression measures (i.e. self-report versus a laboratory paradigm), but it is also possible that the relationship between PTSD symptom clusters and aggression differs among subpopulations of trauma survivors (e.g., military veterans vs. civilians). In addition, the fact that the majority of the current body of work used cross-sectional designs limits the extent to which these patterns can be understood across time or other dimensions and the degree to which these relationships can be conceptualized as mechanisms of aggression. Given the disparities in findings, additional research to examine ways in which additional, contextual factors give texture and shape to the relationship between PTSD and aggression is warranted.

Aggression among Combat Veterans

Some research suggests that military experience, especially combat exposure, may represent a particular risk factor contributing to the relationship between PTSD and aggression. For example, in a broad meta-analysis of 39 studies investigating the association between anger (frequently conceptualized as a prelude to aggressive behavior), hostility, and PTSD, Orth and Wieland (2006) found that the greatest effect sizes linking anger-hostility and aggression were among those exposed to military war experiences. Similarly, in a review of aggression and violence among post-9/11 veterans, Macmanus and colleagues (2015) found a small to moderate correlation between combat exposure and aggression across 3 studies. Nevertheless, combat exposure alone does not seem to account for the vulnerability to aggression among veterans. Jakupcak and colleagues (2007) found that, among Iraq and Afghanistan War veterans, those who screened positive for PTSD or who endorsed subthreshold PTSD symptoms were significantly more likely to report aggressive behaviors than veterans without symptoms of PTSD, suggesting that aggression may be a kind of behavioral manifestation related to the experience of PTSD. In another study, Teten and colleagues (2010) reported that impulsive, rather than premeditated, aggression best characterized the kinds of aggressive behaviors perpetrated by veterans, and that veterans with PTSD were more likely to engage in impulsive aggression than those who did not meet diagnostic criteria for PTSD. Indeed, among veterans with PTSD, rates of violent offending are reported to occur in the range of approximately eight to 20 percent (Van Vorhees et al., 2014), outstripping rates of aggression among civilians and veterans without PTSD (Corrigan & Watson, 2005; Elbogen, Johnson, Wagner, Sullivan, Taft, & Beckham, 2014; Macmanus et al, 2013). Rates of self-reported physical aggression are similarly elevated, with pooled prevalence estimates of about 29% for all forms of physical aggression

reported in the last month among currently and formerly serving military personnel (MacManus et al., 2015). Still, not all veterans report difficulties with aggression, and not everyone with PTSD endorses aggressive behavior, suggesting that military experience or PTSD alone do not account for the full relationship with aggression.

The Role of Anger

Anger has been theorized to play a role in aggressive behaviors among veterans with PTSD, beyond the confound of measurement overlap – that is, even when items alluding to anger are removed from indices of PTSD, meaningful and significant relationships between PTSD symptomology and measures of anger persist (Jakupcak et al., 2007; Lasko, Gurvits, Kuhne, Orr, & Pitman, 1994; Novaco & Chemtob, 2002). Anger is frequently conceptualized as an antecedent to aggression (Daffern & Howells, 2007), although anger does not exclusively predict aggressive behavior (Buss, 1961) and some forms of aggression (i.e. instrumental aggression) occur in the absence of anger. Nevertheless, anger is commonly identified by clinicians and patients alike as the most pressing clinical concern for veterans with PTSD (Biddle, Elliott, Creamer, Forbes, & Devilly, 2002; Rosen, Adler, & Tiet, 2013), likely due to the negative impact of anger on interpersonal relationships. Indeed, some evidence suggests that anger may disinhibit aggression perpetration (Taft, Creech, & Murphy, 2017). Social information processing models posit that trauma exposure and subsequent PTSD development are associated with the formation of hostile attribution biases (Chemtob, Novaco, Hamada, Gross, & Smith, 1997), or cognitive-perceptual distortions in which individuals perceive stimuli as hostile or threatening at a higher rate and a lower threshold than others without these cognitive processing biases. A hostile attribution bias has also been linked to the core PTSD symptom of hyperarousal (Chemtob et al, 1997; Griffith, 2015; Lamotte & Taft, 2017), though the degree to which the

relationship between cognitive distortions of hostility/threat and the experience of heightened and persistent physiological arousal is linear versus cyclical is unclear. Nevertheless, in such a model, anger may serve as a gatekeeper by which aggressive behavior is dampened or amplified under instigating circumstances that cue aggressive responses among those primed to perceive hostility more readily (Taft et al., 2017). For example, Novaco and Chemtob (2015) found an interactive effect of PTSD and anger on aggression perpetration among Vietnam veterans, concluding that the relationship between violence and PTSD dissipates in the absence of anger. Taft and colleagues argued for a similar but slightly modified model, finding evidence that cognitive processing biases mediate relations between PTSD and anger expression, and that these biases were also associated with intimate partner violence (IPV) perpetration (Taft, Weatherill, Scott, Thomas, Kang, & Eckhardt, 2015).

Anger, however, is often conceptualized as an emotional response secondary to other feelings, particularly internalizing emotions that may cue vulnerability or defensiveness (Novaco, 1976). For example, Foa and colleagues (Feeny, Zoellner, & Foa; 2000; Foa, Riggs, Masie, & Yarczower, 1995) argued that anger disrupts PTSD treatment efficacy precisely because it masks engagement with the feeling of trauma-related fear. In other words, anger and the expression of anger through aggressive means prevent the individual from engaging with the core feelings of fear around which the PTSD pathology is organized. Others have argued that anger serves a similar function in relation to shame, another fundamental emotional feature of current conceptualizations of PTSD (APA, 2013), in which anger actively dislodges the painful and passive experience of shame (Miller, 1985).

The Role of Shame

Although operational definitions vary, in the affective literature shame is best conceptualized as having two core features: 1) an internal state of intense emotional pain associated with feelings of inferiority and 2) an external sense of negative evaluation by others as unworthy or defective (Budden, 2009). As the construct of PTSD evolves, DSM diagnostic criteria have broadened to include consideration of shame and guilt within the negative emotions facet of PTSD. Conceptually, shame is distinct from the related construct of guilt, though both have been discussed in the context of combat-related PTSD (see Crocker, Haller, Norman, & Angkaw, 2016). Guilt, however, is typically related to a specific behavior or action and is sometimes associated with positive outcomes (e.g. reparation), whereas shame is a more comprehensive state of negative evaluation of the entire self and is frequently associated with isolation, withdrawal, and considerable emotional suffering (Crocker et al, 2016; Leskela, Dieperink, & Thuras, 2002). Nevertheless, current conceptualizations of PTSD acknowledge that shame may be a significant, albeit not wholly understood, feature of the diagnosis, particularly in terms of the negative alterations in cognitions and mood that frequently occur among those with PTSD (APA, 2013).

Given the painful and vulnerable nature of shame, some have argued that acts of aggression may serve as a way to regulate or avoid feelings of shame (Gilligan, 2003). Specifically, this model conceptualizes aggression as a maladaptive way of subverting an intensely painful and internalized experience into a more manageable externalized experience. For example, Jakupcak and colleagues (2005) found that among men, shame, fear of emotion, and rigid beliefs about masculinity predicted overt hostility. Similarly, Tangney and colleagues (1992) found that shame was positively associated with anger arousal and reactivity. Moreover,

shame has been identified as a frequent antecedent to acts of violence and aggression with Velotti and colleagues (2014) arguing that the link between shame and aggression is best understood in the context of rejection sensitivity, in which perceived rejections cue shame responses that are ultimately expressed via aggression. This model has similarly been applied to male perpetrated IPV and other forms of violence (Downey, Feldman, & Ayduk, 2000; Leary, Twenge, & Quinlivan, 2006). Taken together, these studies argue for a conceptualization of aggression that accounts for the role of shame, perhaps especially among men.

PTSD itself may generate shame cues within the affected individual, particularly when it is associated with threats to identity or sense of self. Indeed, cognitive-based treatments of PTSD are largely organized around rigid or global beliefs that capture the negative evaluations associated with shame (i.e. “There is something seriously wrong with me,” “I am bad”; Lawrence & Taft, 2013). In turn, Elison and colleagues (2014) provided an extended framework by which to potentially understand the identity threat that occurs in the context of trauma exposure and PTSD development among combat veterans. In particular, they argued that emotional experiences like shame and aggression occur in response to losses of rank, status, or relational value. In other words, when these kinds of losses occur, individuals embedded in hierarchical social settings experience some degree of shame, or a sense of inadequacy and social failure overlaid with profound emotional pain. Aggressive acts are thus conceptualized as a way to reassert belonging or dominance back into the social hierarchy from which they were excluded. Given the rigidly hierarchical nature of the military, aggression as a way to reclaim lost identities of rank and dominance and to combat against feelings of shame may be a particularly salient way of conceptualizing the emotional experience of combat trauma and PTSD among military personnel. Specifically, the experience of trauma and the subsequent

development of PTSD may be seen as a very literal loss of rank, status, or belonging, which brings with it a deep sense of shame and potentially a shattering of identity. Aggression may then occur in this context as a maladaptive way of regaining access to a hierarchy, rank, or identity value that has been lost and to negate internalized pain associated with these losses.

Study Aims

The present study was designed to examine aggression, shame, and PTSD symptoms among post-9/11 combat veterans. Specifically, the study sought to extend and replicate prior research by considering two major questions:

1) How do PTSD symptom domains relate to aggression and shame among post-9/11 veterans?

2) Does shame mediate the relationship between PTSD symptoms and aggression?

First, it was hypothesized that, in line with prior research, hyperarousal symptoms would be significantly associated with aggression. However, given inconsistent findings relating aggression with other PTSD symptom domains, we investigated the pattern of correlations between aggression, shame, and all PTSD symptom clusters. Second, it was hypothesized that shame would mediate the relationship between aggression and PTSD.

Method

Participants

Participants were adult Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans receiving primary care services through the Memphis Veterans Affairs Medical Center (VAMC). A total of 58 participants completed both assessment appointments. Following PAI interpretation guidelines (Morey, 1991), 6 participants were excluded from the final analyses for invalid PAI profiles. PAI responses are considered invalid and uninterpretable if

elevated scores are generated for the Infrequent (INF *T* score greater than or equal to 75) or Inconsistent (INC *T* scores greater than or equal to 73) validity scales.

Of the remaining 52 participants, 78.8% were male ($n = 41$). In terms of race and ethnicity, the majority of the sample identified as either Black/African American (50%; $n = 26$) or White (48.1%, $n = 25$). Additional identities included: 5.8% Asian ($n = 3$), 3.8% Hispanic/Latino ($n = 2$), and 7.7% Native American ($n = 4$). Categories are not cumulative as participants were allowed to select multiple ethnic and racial identities. Approximately 44% ($n = 23$) of the sample reported having served multiple deployments, with the remaining participants reporting a single deployment. Half of the sample ($n = 26$) met criteria for PTSD using CAPS diagnostic criteria. A smaller proportion of the sample (21.2%, $n = 11$) endorsed *T* scores of 70 or greater on the PAI Aggression scale, indicative of clinically significant levels of aggression according to PAI interpretation guidelines (Morey, 1991)

Procedure

Data were collected as part of a study of OEF and OIF veterans seeking health care at the Memphis VAMC. Participants were approached in waiting areas throughout the VAMC and invited to participate if they had served combat deployments in support of OEF/OIF. Interested and eligible veterans were scheduled for two research appointments where they completed a battery of assessments, either at the researcher team's university offices or at the Memphis VAMC, depending on participant preference. Both appointments generally took place within one week. Cross-sectional data was collected over the course of two initial appointments to reduce participant burden and shorten appointment times. Structured clinical interviews were conducted by trained, doctoral-level clinical psychology students. All procedures were reviewed and

approved by the Institutional Review Boards of the University of Memphis and the Memphis VAMC, and participants were compensated for their time.

Measures

Clinician Administered PTSD Scale for DSM-IV (CAPS; Blake et al., 1995). The CAPS is a structured diagnostic interview for assessing PTSD. It is widely considered the gold standard for PTSD assessment and is used in clinical and research settings (National Center for PTSD, 2017). Average administration time of the CAPS is 45-60 minutes (Orsillo, 2001). The CAPS is comprised of 17 questions measuring the frequency and intensity of the 17 symptoms of PTSD as defined in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychological Association, 2000). Responses are scored using a 5-point Likert scale ranging from 0 (*the symptom does not occur or does not cause distress*) to 4 (*the symptom occurs nearly every day or causes extreme distress and discomfort*). Scores can be summed for a dimensional score of PTSD symptom severity. In the present study, items were assessed using the diagnostic algorithm consistent with the DSM-IV (APA, 2000), referred to as the Frequency-1/Intensity-2 (or “F1/I2”) scoring rule. Items with a frequency score of 1 or greater and an intensity score of 2 or greater were considered positive for the presence of a symptom. Diagnostic criteria for PTSD was met if, at minimum, 1 reexperiencing, 3 numbing and avoidance, and 2 hyperarousal symptoms were positively endorsed. The CAPS has been used extensively in veteran populations (see Weathers, Keane, & Davidson, 2001 for a review), has consistently demonstrated strong reliability (Cronbach’s alpha values ranging from .73 to .98) and has performed well on indices of validity (see Orsillo, 2001 for a review). In the present sample, Cronbach’s alpha was .84.

Personality Assessment Inventory – Aggression Scale (PAI; Morey, 1991). The PAI is a 344-item self-report measure of clinical characteristics and psychopathology symptoms. The Aggression scale includes 18 statements evaluating aggressive attitudes (e.g. “I have a bad temper”), verbal aggression (e.g. “I tell people off when they deserve it”) and physical aggression (e.g. “Sometimes I’m very violent”). Participants rate each item on a 4-point scale ranging from *false* to *very true*. Responses are summed for a total score and standardized into a *T* score. Scores above 70 are considered clinically relevant and are suggestive of an individual with problematic levels of aggression that are expressed above and beyond non-pathological irritability or quick-temperedness. The Aggression scale is organized into three subscales, with two of the subscales – verbal aggression and physical aggression – tapping into historical instances of aggressive behavior. The third subscale, aggressive attitudes, evaluates the degree to which individuals identify with aggressive beliefs and stances. The PAI has been used in numerous studies, including those focused on military veterans with combat exposure (Bellet, McDevitt-Murphy, Thomas, & Luciano, 2017; Ellis, Peterson, Bufford, & Benson; 2014; Miskey, Shura, Yoash-Gantz, & Rowland, 2015; Mozley, Miller, Weathers, Beckham, & Feldman, 2005; Van Voorhees et al, 2014). The PAI Aggression subscales have been validated in combat veterans with PTSD, demonstrating strong convergent and divergent validity (Crawford, Calhoun, Braxton, & Beckham, 2007). In the present sample, the measure demonstrated strong full-scale reliability ($\alpha = .89$) and adequate to strong subscale reliability (verbal aggression: $\alpha = .62$; physical aggression: $\alpha = .77$, aggressive attitudes: $\alpha = .85$).

Shame Inventory (Rizvi, 2010). The Shame Inventory is a self-report questionnaire assessing various aspects of shame. It includes three questions assessing the frequency, severity, and negative impact of shame rated from zero (*never/none*) to four (*always/extremely*), which

can be summed for a value of trait shame. Subsequently, the respondent is asked to rate their degree of shame from zero (*no shame*) to four (*extreme shame*) in response to 50 specific, cued scenarios (e.g., “a time when I cried in front of others,” “a time when I lost something important”). Respondents can also indicate the scenario has not happened to them or does not apply to them by selecting “x.” The 50 cued items are a measure of state-related shame. Averages can be calculated for trait, state, and total shame scores. In initial evaluations of psychometric quality among clinical and non-clinical samples, the measure was judged to have good internal consistency, test-retest reliability, construct validity, and predictive validity (Rizvi, 2010). In the present sample, the measure demonstrated strong full-scale reliability ($\alpha = .93$) as well as strong reliability for both subscales (trait shame: $\alpha = .95$; cued shame: $\alpha = .94$).

Deployment Risk and Resilience Inventory – Pre-deployment Stressors Subscale (DRRI; King, King, Vogt, Knight, & Samper, 2006). The DRRI is a 201-item inventory that aims to capture contextual characteristics of deployment-related factors such as different kinds of combat events, perceptions of unit support, pre-and post-deployment experiences, and more. The DRRI was originally developed and validated using nationally representative samples of Gulf War veterans and has since become one of the key measures for assessing deployment-related factors that are believed to confer risk or resilience on differential mental health outcomes. The Pre-deployment Stressors subscale includes 15 items that assess exposure to adverse experiences prior to deployment ranging from psychosocial stressors (e.g. “I lost my job”) to traumatic events (e.g. “experienced unwanted sexual activity as a result of force, threat of harm, or manipulation”). Reliability in the present sample was good ($\alpha = .79$).

Data Analysis Plan

The data were screened for normality using standards recommended by Tabachnick & Fidell (2006). No problems with skewness or kurtosis of study variables were identified. Preliminary descriptive analyses were conducted, followed by correlations to examine relationships between the main study variables and demographic variables, including race, age, gender, military demographics, deployment related characteristics, cumulative amount of time deployed, and time since returning from the most recent deployment.

To address the first major research question and investigate relationships between study variables, correlations were conducted between CAPS, PAI Aggression, and the Shame Inventory. Analyses were conducted using both total and subscale scores for the CAPS, PAI Aggression, and the Shame Inventory. Specifically, we calculated total severity as well as symptom cluster severity scores on the CAPS. Similarly, the subscales of the PAI Aggression scale – Aggressive Attitudes, Physical Aggression, and Verbal Aggression – were examined in order to distinguish aggressive beliefs and actual aggressive episodes. Finally, the Shame Inventory subscales assessing trait and cued shame were analyzed separately.

Results from the first phase of analyses were used to guide which models were subsequently investigated in the next set of analyses, designed to analyze the role of shame as a mediator of the relationship between PTSD symptom severity and aggression. A mediation analysis using Hayes' (2013) PROCESS macro was conducted to parse the indirect effect of CAPS severity scores on PAI Aggression scores through Shame Inventory scores. We calculated Pearson correlation coefficients to examine the relations between PAI Aggression scores and Shame Inventory scores. Based on the presence of significant correlative relationships, four models were selected to analyze using the PROCESS macro (see Figure 1). Several potential

covariates were considered for inclusion; these included pre-deployment stressors, number of months deployed, and months since most recent return from deployment and we planned to include any of these that demonstrated a statistically significant zero-order correlation with the dependent variable. For all primary analyses, significance levels were set at the .05 level.

Results

Descriptive statistics and sample characteristics are reported in Table 1. Half of the sample ($n = 26$) met criteria for PTSD using CAPS diagnostic criteria. A smaller proportion of the sample (21.2%, $n = 11$) had T scores of 70 or greater on the PAI Aggression scale, indicative of clinically significant levels of aggression (Morey, 1991). The average trait shame score on the Shame Inventory was 1.62 ($SD = 1.27$) on a scale from 0 to 4, whereas the average cued shame score was 48.88 ($SD = 31.43$), with possible total scores ranging from 0 to 124. When these scores were combined for a total Shame Inventory average ranging from 0 to 4, the mean was 1.53 ($SD = 0.89$), overall suggesting that there were low levels of shame in this sample.

We then examined the correlations between primary study variables and demographic and military history variables. As expected, CAPS total score was positively correlated with having deployed more than once ($r_{pb} = .41, p < .01$). Trait shame scores were also positively correlated with having deployed more than once ($r_{pb} = .47, p < .01$) as well as with greater number of months since returning from the most recent deployment ($r = .39, p < .01$). Cued shame scores followed a similar pattern as trait shame scores, correlating positively with having deployed more than once ($r_{pb} = .32, p < .05$) and with number of months since returning from the most recent deployment ($r = .45, p < .01$). There were no significant correlations between the full PAI Aggression scale and any of the demographic or military history variables.

Next we examined correlations investigating relationships among the main study variables. Results are reported in Table 2. Generally, the three primary study variables (shame, aggression, and PTSD) were positively correlated with each other, with the exception of the Shame Inventory scores and the PAI Verbal Aggression subscale, which did not demonstrate a statistically significant relationship. Cued shame and PAI Physical Aggression subscale scores also failed to demonstrate a relationship. Results from the first set of primary analyses were used to guide which models demonstrated meaningful relationships at the .05 statistical significance threshold, in order to inform subsequent mediation analyses.

Four models were selected (see Figure 1) to analyze the role of shame as a mediator of the relationship between CAPS total severity and PAI Aggression scores using Hayes' (2013) PROCESS macro. PROCESS uses a nonparametric bootstrapping method which allows for the probing of effects without making assumptions about the sampling distribution of the indirect effect. As shown in Table 3, Trait Shame significantly mediated the relationship between CAPS total severity and the PAI Physical Aggression subscale. In other words, there was a significant indirect effect of CAPS on PAI Physical Aggression through Trait Shame ($B = .08$, $SE = .04$, 95% CI = .01 - .18). None of the other models we tested were significant.

Discussion

The present study examined relations between self-report ratings of shame, aggression, and PTSD symptom severity. Approximately half of the sample met criteria for PTSD, and a smaller proportion (about 20%) endorsed clinically significant levels of aggression. Levels of trait and cued shame were approximately comparable to those reported in a non-clinical undergraduate sample. Results of correlational analyses indicated moderately strong and positive relationships among most full scales and subscales of the constructs of interest, aligning with

prior research and theory demonstrating that shame, aggression, and PTSD are related and tend to correlate in the same direction. When investigated at the subscale level, however, the relationships between shame and aggression correlated in more nuanced ways. Specifically, whereas aggressive attitudes were significantly related to both trait and cued shame, physical aggression was correlated with trait shame but not cued shame, and verbal aggression was unrelated to cued or trait shame. Subsequent analyses sought to determine if shame played a mediating role in the relationship between aggression and PTSD symptom severity. Four models were tested, and results indicated that trait shame significantly mediated the relationship between total PTSD severity and physical aggression. These findings lend credence to prior theoretical literature suggesting that shame, specifically trait shame, may play a significant role in the elevated rates of aggression among veterans with PTSD and further suggest that shame and PTSD may make unique contributions to aggression.

The relevance of shame to aggression is evident in research on violent offenders. Gilligan (2003) found, across more than three decades of qualitative interviews, that men who were incarcerated articulated their acts of violence as ways of reclaiming, defending, or cultivating respect from others within the context of their social structures. For many of the men interviewed, the ability to elicit respect through threat of violence was an important and often singular pathway towards a sense of internalized dignity or pride, which might best be conceptualized as the antithesis of shame. Whereas shame centers around being seen by others as inferior, defective, or unworthy of social inclusion, dignity/pride positions the bearer as one worthy of respect, honor, and reverent social inclusion. Among these men living in highly rigid and hierarchical social institutions (e.g. the prisons, penitentiaries, and high security mental health facilities where Gilligan's interviews were conducted), the costs of physical aggression

(e.g. solitary confinement or other punitive measures) were negligibly relevant when the benefits of accruing respect from others were so great. With no other recourse for reducing their shame and increasing their sense of pride and dignity, and despite severe and resounding consequences, the men interviewed in Gilligan's work continued to engage in violent acts repeatedly and cyclically.

Gilligan's anthropological investigation of the cycle of shame and violence in institutional structures mirrors the theoretical work of Elison and colleagues (2014) who argue that the shame-aggression link is most salient in rigid hierarchical social contexts. In social hierarchies, social inclusion and exclusion operate as forces of behavioral control through the mechanism of shame – in other words, actions or characteristics that result in social exclusion produce shame, widely interpreted in the self-conscious emotion literature as a profoundly, nearly intolerable emotional experience. Acts of violence or physical aggression are perpetrated in attempts to reduce shame, gain respect and/or dignity, and re-enter the social structure. The results of the present study lend support to the theory proposed by Elison et al., suggesting that veterans coping with the social exclusion and stigma wrought by greater levels of PTSD symptom severity may engage in acts of physical aggression as a means of managing profoundly painful experiences of shame and seeking re-entry into a rigidly hierarchical community frequently characterized by masculine notions of aggression and violence.

The present study's findings are also aligned with prior quantitative investigations of shame and violence, including seminal findings linking shame with anger arousal and reactivity (Tangney et al., 1992). In the literature on intimate partner violence, rejection sensitivity has frequently been conceptualized as a mechanism of male-perpetrated violence against women, in which some men respond to perceived rejection with violence as a way to reassert dominance

and to manage the evoked feelings of shame. As such, a violent or aggressive response to shame may not be unique to those with PTSD, but rather may represent one form of the shame-aggression pathway as an externalizing process. PTSD, indeed, may function as a similar kind of rejection cue, whether via the stigmatizing experience of mental illness or through specific symptoms that afford feelings of shame (e.g. intrusive memories of the trauma perceived as a sign of weakness; Lee, Scragg, & Turner, 2001; Wilson, Droždek, Turkovic, 2006). Although Wilson and colleagues (2006) articulate that posttraumatic shame may operate via several pathways, Elison et al.'s theoretical work suggests that social exclusion via a loss of role/place in one's community may explain how shame in the wake of trauma contributes to aggression. In veterans with PTSD, whose combat traumas occurred in the context of being embedded in a rigidly hierarchical social system like the military, these operative processes might be particularly salient.

In the present study, only trait shame, and not cued shame, mediated the relationship between PTSD symptom severity and physical aggression. Although other forms of aggression were tested via mediation models (e.g. aggressive attitudes and a combined general aggression score), neither trait nor cued shame played a significant mediating role in the relationship between PTSD symptom severity and these forms of aggression. It is unclear why shame did not mediate the pathways between PTSD and other forms of aggression, though these findings suggest that different aspects of aggression show different patterns of relationships with both PTSD and shame. Although both PTSD and shame were correlated with the aggressive attitudes subscale, these factors appear to make non-overlapping contributions to this aspect of aggression. Interestingly, verbal aggression was correlated with PTSD but not with shame and this may suggest that this pattern of aggression is more normalized within a primarily male veteran sample

and thus not uniquely explained by shame. In addition, results suggest that trait shame and cued shame operate in substantively different ways, with trait shame evidencing a relationship with both PTSD and aggression, and cued shame responses correlating less with these variables. This aligns with prior work emphasizing the enduring importance of trait shame, or shame proneness, versus the more fleeting impact of cued shame or state shame.

Nevertheless, prior work with a primarily male veteran sample found that trait shame partially mediated the association of PTSD with verbal aggression but not with physical aggression (Crocker et al., 2016). Discrepant findings may in part be explained by measurement difference. Insufficient variation in aggression scores may also have contributed to differences in findings. Although both samples were characterized by low levels of physical aggression, the majority of Crocker and colleagues' sample reported no physical aggression at all and the range of scores was significantly truncated. This stands in contrast to the present sample, wherein approximately 20% of the sample had scores in the clinically significant range for aggressive behavior (e.g. full scale PAI aggression with a *T* score of 70 or greater). Nevertheless, additional investigation is warranted to determine if the shame-aggression pathway is reliably found among veteran samples or if additional factors or processes impact the likelihood of shame's mediating role.

Some important limitations should be noted. First, the sample size was moderately small, which limited our power to detect other significant nuances in study findings. Moreover, smaller sample sizes limit generalizability, indicating caution in interpreting the reliability of study findings and the degree to which these findings might be reliably reproduced in other veteran samples. Other characteristics of the sample that may constrain generalizability include that the sample was mostly male and was recruited via the VAMC. Female or other gender samples, or

samples recruited outside of the VAMC system, may differ from the current group. Moreover, it would be important to understand if these or similar pathways are found in non-combat military samples. In addition, the present study did not assess the role of anger, though anger is ostensibly and frequently related to aggression and is considered a core feature of the emotional landscape of PTSD in its current conceptualization. Although anger reactivity often precludes aggressive outbursts, shame may interact with anger in unique ways.

Finally, the current study is cross-sectional, such that it is impossible to determine temporal or directional relations between study variables. For example, higher levels of aggressive behavior may artifactually increase PTSD symptom severity and similarly be explained by trait shame. Still, while we might hypothesize that individuals who engage in more acts of physical aggression may subsequently be more likely to be exposed to traumas, aggressive behavior alone does not explain PTSD symptom severity. Moreover, a reliable body of literature implicates aggression as a functional consequence, rather than predictor, of PTSD. In addition, while trait shame suggests a predisposition to impairing or distressing levels of shame, the present study was not able to determine the impact of trauma exposure and PTSD development on shame levels. It may be that these are important temporal gradations to assess, and future longitudinal studies of the course and interaction of trait shame with trauma exposure and PTSD development would be worthwhile.

Despite these limitations, the current study suggests that shame may function as a mediating factor in the relationship between PTSD symptom severity and acts of physical aggression in the context of a military sample with combat trauma. Findings underscore the importance of assessing and integrating shame into case conceptualization and treatment planning to comprehensively treat veterans coping with the aftermath of combat. In addition to

the fact that shame may surface in the context of PTSD and thereby contribute to aggression, the present findings also indicate that trait shame may independently contribute to aggressive behaviors, suggesting that assessing for broader experiences of shame among those with trauma responses is uniquely valuable. Just as anger and guilt have been shown to disrupt exposure-based therapies for PTSD (e.g. Foa et al., 1995; Pitman et al., 1991), shame may similarly interfere with effective therapy (Beck et al., 2011). Clinicians seeking to incorporate shame conceptualizations into their therapy delivery would benefit from an understanding of the myriad ways that shame cognitions may be related to PTSD symptomology (e.g. see Lee et al., 2001).

Although guilt cognitions have been more broadly incorporated into evidence-based care for PTSD (e.g. in Cognitive Processing Therapy; Nishith, Nixon, & Resick, 2005), shame has received less attention. Moreover, therapies that do incorporate shame tend to do so from a trauma-cued perspective (rather than trait shame) and typically look at shame in combination with or relative to guilt (e.g. Kubany & Ralston, 2006). Current study findings suggest that research investigating the tendency to experience shame (e.g. trait shame) uniquely is necessary.

More broadly, the present findings speak potentially to the dislocating effects of the deployment-reintegration cycle wherein veterans find themselves embedded in and thrust out of rigidly hierarchical social systems as they move between the military and civilian worlds. Reintegration problems are well-documented (Harvey et al., 2011; Mittal et al., 2013; Sayer et al., 2011) with some research indicating that reintegration distress is heightened among those with PTSD (Marek & D'Aniello, 2014; Sayer et al., 2010). Similarly, the present study finding that trait shame, rather than cued shame, mediated the role between PTSD and aggression suggests that those with a predisposition to experience shame may be particularly vulnerable to further negative outcomes following traumatic experiences. Indeed, methodological limitations

preclude the ability to analyze these relations in the current sample, but it may be that long-term problems with negative emotions like anger and shame, as well as behavioral problems like aggression combine to situate men in pipelines to the military, where their risk of encountering trauma and developing PTSD becomes amplified. As such, the social implications of the present study are also worth considering. Research that considers the developmental trajectory of shame and the cultural contexts in which shame is more or less salient is important in understanding the broader implications of the current findings.

Study findings implicate shame as a pivotal component of the emotional landscape linking PTSD and aggression among combat veterans. Although a growing body of literature has begun to consider how shame operates within the context of PTSD, until recently other emotions (e.g. fear) have taken primacy in understanding the negative affective experience of PTSD. The mediating role of shame between PTSD and physical aggression in the current sample, however, suggests that self-conscious emotions may be integral to understanding how PTSD is related to additional negative outcomes, like aggression, or to other key clinical variables (e.g. treatment engagement). Future research that aims to recognize the operative role of shame in contributing to further negative outcomes or outcomes that interrupt recovery trajectories (e.g. substance misuse, risk-taking) is warranted and timely.

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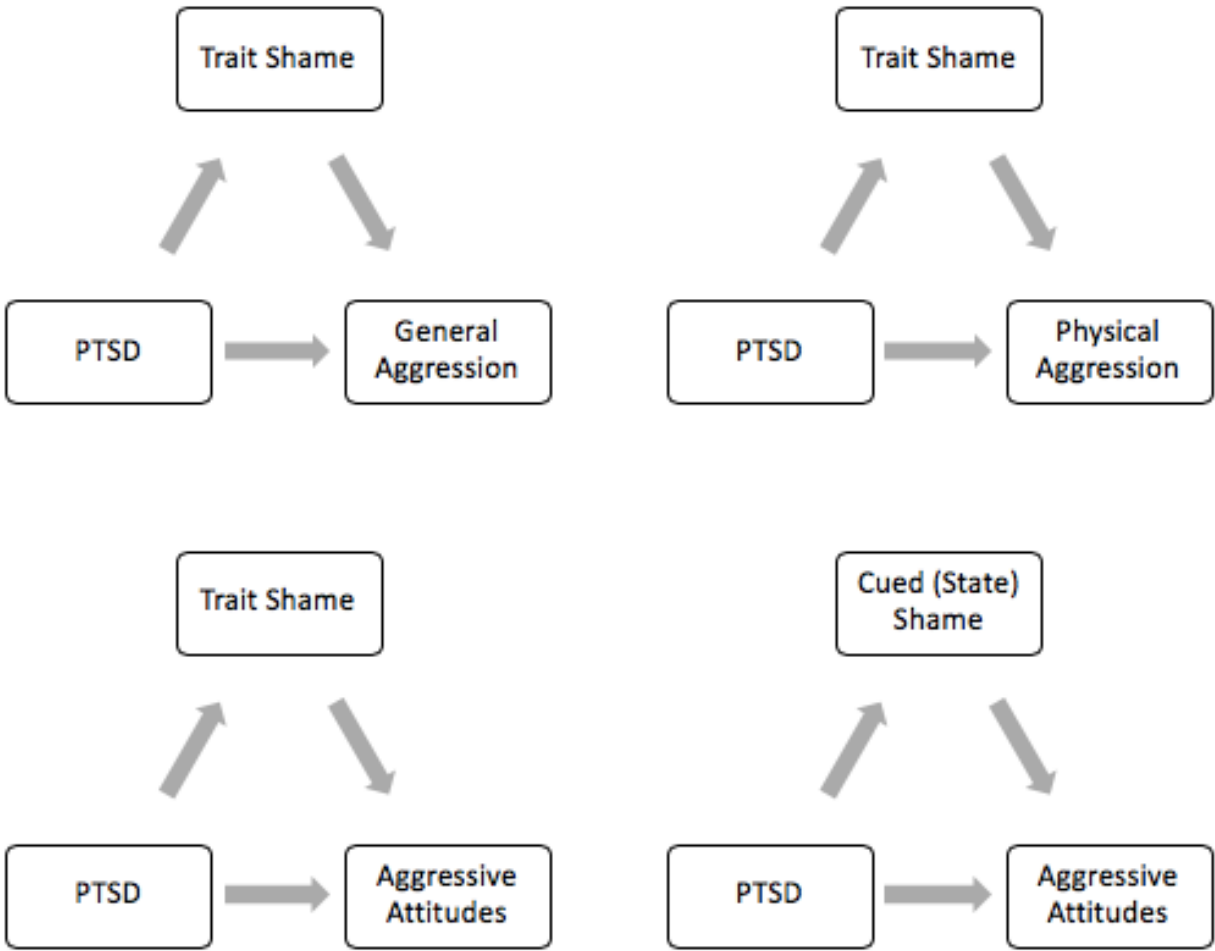


Figure 1. Testable models for investigating the mediating effects of trait and cued shame.

Table 1. Sample Characteristics and Descriptive Statistics (n = 52).

Variable	Descriptive Statistics
Age, Mean (<i>SD</i>)	37.04 (11.26)
Female, <i>n</i> (%)	11 (21.15)
Race, <i>n</i>	
White	25
Black	26
Asian American	3
American Indian/Native Alaskan	4
Ethnicity, <i>n</i> (%)	
Hispanic or Latino	2 (3.85)
Not Hispanic or Latino	50 (96.15)
Military Branch, <i>n</i> (%)	
Army	36 (70.59%)
Navy	2 (3.92%)
Marine Corps	7 (13.73%)
Air Force	6 (11.76%)
Coast Guard	0 (0.00%)
(n = 51)	
Single or Multiple Deployments, <i>n</i> (%)	
Single	
Multiple	28 (53.85%)
(n = 51)	23 (44.23%)
Cumulative Months of Deployment, Mean (<i>SD</i>)	18.08 (12.16), min. = 3, max. = 54
(n = 49)	
Months Since Most Recent Deployment Return, Mean (<i>SD</i>)	52.66 (35.22), min. = -8.00, max. = 121.00
(n = 50)	
CAPS total severity, Mean (<i>SD</i>)	
Possible range: 0-136	54.73 (31.93)
PAI Aggression – full scale, Mean (<i>SD</i>)	60.43 (14.26)
PAI Aggression – Aggressive Attitudes, Mean (<i>SD</i>)	58.55 (14.67)
PAI Aggression – Verbal Aggression, Mean (<i>SD</i>)	57.76 (10.81)
PAI Aggression – Physical Aggression, Mean (<i>SD</i>)	61.37 (15.24)
Shame Inventory – full scale, Mean (<i>SD</i>)	
Possible range: 0-4	1.53 (0.89)
Shame Inventory – Trait Shame, Mean (<i>SD</i>)	
Possible range: 0-4	1.62 (1.27)
Shame Inventory, Cued Shame, Mean (<i>SD</i>)	
Possible range: 0-124	48.88 (31.43)

Note: Min. = minimum. Max. = maximum. SD = Standard deviation. Race categories are not cumulative as participants were allowed to select multiple racial identities. A small number of participants declined to provide deployment related details. One person was currently on active

duty deployment and therefore reported their most recent deployment return as occurring 8 months in the future, thus accounting for the negative minimum Months Since Most Recent Deployment Return value. PAI scores are converted to *T* scores, with *T* scores above 50 representing scores above the average based on population norms, and *T* scores of 70 or greater representing clinically significant levels of aggression.

Table 2. Correlations of main study variables, full scales and subscales.

	Correlations												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. CAPS total score	-	.87***	.94***	.84***	.89***	.92***	.53***	.50***	.38**	.49***	.36**	.55***	.39**
2. CAPS B Re-experiencing		-	.71***	.74***	.63***	.71***	.47**	.45**	.38**	.42**	.29*	.37**	.33*
3. CAPS C Avoidance & Numbing			-	.82***	.97***	.82***	.51***	.49***	.35*	.50***	.40**	.63***	.43**
4. CAPS C Avoidance				-	.66***	.72***	.49***	.43**	.43**	.45**	.40**	.57***	.46**
5. CAPS C Numbing					-	.77***	.47**	.46**	.28†	.47**	.37**	.59***	.37**
6. CAPS D Hyperarousal						-	.45**	.41**	.31*	.41**	.27†	.46**	.28*
7. PAI Aggression – full scale							-	.89***	.85***	.87***	.28†	.42**	.25†
8. PAI Aggression – Aggressive Attitudes								-	.62***	.61***	.40**	.35*	.34*
9. PAI Aggression – Verbal Aggression									-	.63***	.06	.22	.09
10. PAI Aggression – Physical Aggression										-	.25†	.49***	.21

Table 3. Summary of mediation analysis.

Independent Variable	Mediating Variables	Dependent Variable	Coefficient	SE	95% CI	
					LL	UL
CAPS	SI - Trait Shame	PAI Aggression (full scale)	.05	.03	-0.01	0.12
CAPS	SI – Trait Shame	PAI – Physical Aggression	.08	.04	.01	.18
CAPS	SI – Trait Shame	PAI – Aggressive Attitudes	.03	.04	-0.04	.11
CAPS	SI – Cued Shame	PAI – Aggressive Attitudes	.03	.03	-0.01	.11

Note: CI = Confidence interval. LL = Lower limit. UL = Upper limit. CAPS = Clinician Administered PTSD Scale. PAI = Personality Assessment Inventory. SI = Shame Inventory