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# Emotions and emotion regulation in posttraumatic stress disorder

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Posttraumatic stress disorder (PTSD) has been associated with negative emotions such as shame, guilt, anger, and disgust, as well as impairments in the ability to effectively regulate these emotional states. There is evidence showing that each of these negative emotions and emotion regulation difficulties are related to the severity of PTSD stemming from various trauma types. In contrast, much less is known about the temporal relationship between these features and PTSD. Studies have found that treatments for PTSD often lead to improvements in these negative emotions and in emotion regulation difficulties, but how these features impact the efficacy of various PTSD treatments is less clear.

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## Introduction

Early conceptualizations of posttraumatic stress disorder (PTSD) focused on fear and anxiety as the primary emotional experience of the disorder [1,2]. Although fear and anxiety are central to PTSD, researchers have also recognized the role of other negative emotions in PTSD, such as shame, guilt, anger, and disgust. In fact, many of these emotions are now described in the revised diagnostic criteria for PTSD: 'persistent distorted blame of self or others for causing the traumatic event or for resulting consequences' and 'persistent negative trauma-related emotions — for example: fear, horror, anger, guilt, or shame' [3]. Whereas fear and anxiety are somewhat inseparable from PTSD, the relationships between shame and guilt, anger, and disgust, with PTSD have received considerable empirical attention. We conducted a search using PsycINFO and PubMed for empirical studies that included the term 'PTSD' or 'trauma' and either 'emotion,' 'shame,' 'guilt,' 'anger,' or 'disgust'. For each of these emotional states, we summarize research on the nature of their association with PTSD, the temporal relationship between the two constructs, the impact of PTSD treatment on the emotion, and the impact of the emotion on PTSD treatment outcomes. Given the increasing focus on how emotion regulation strategies relate with types of trauma and PTSD symptoms, we also review evidence and treatment implications of emotion regulation deficits in PTSD. Finally, we provide some suggestions for future research examining associated emotions and emotion regulation difficulties in PTSD.

## Shame and guilt

Shame and guilt have long been recognized as important emotional states in PTSD. Shame is typically conceptualized as involving negative evaluations of one's character (e.g. 'I am defective'), whereas guilt involves negative evaluations of one's behavior (e.g. 'I should have fought back') [4]. Shame has been associated with PTSD symptoms in veterans [5] and women who have experienced intimate partner violence (IPV) [6,7]. Similarly, guilt has been associated with PTSD symptoms in veterans [8], women who have experienced IPV [6], and men who caused death through reckless driving [9].

Two studies examining both shame and guilt found that only shame was associated with PTSD severity [5,7]. The null finding with guilt may have been due to the general measure of guilt used in these two studies [6]. While shame is conceptualized as a global negative assessment of the self, guilt is typically considered to be a negative evaluation of a specific behavior [10]. Indeed, Beck *et al.* [6] found that global shame, guilt-related distress, and guilt-related cognitions were significantly associated with PTSD severity whereas global guilt was not. This finding supports current conceptualizations of shame and guilt and highlights the need to employ trauma-specific measures to understand the relationship between guilt and PTSD.

How do shame and guilt relate to PTSD longitudinally? Rothbaum and Foa [11] found that negative posttraumatic cognitions (i.e. negative cognitions about the self [e.g. I'm incompetent] and the world [e.g. the world is completely dangerous, no one can be trusted], which include cognitions related to shame and guilt), were elevated among those with PTSD compared to healthy controls and those who were trauma-exposed but did not have PTSD, with no differences between the latter two groups. Thus, the association between shame and guilt cognitions and PTSD was not accounted for by trauma exposure alone. Although longitudinal data are needed to determine whether shame and guilt drive PTSD

development or vice versa, theoretical accounts of PTSD suggest that the evaluation of the meaning of a trauma is central to the development of PTSD [12,13].

Two studies examined the impact of PTSD treatment on guilt. In a comparison of cognitive-processing therapy (CPT) [14], prolonged exposure therapy (PE) [15], and waitlist, Resick *et al.* [16] reported superior reductions on two of four subscales of the Trauma-Related Guilt Inventory (TRGI) [17] for CPT relative to PE and waitlist. More CPT than PE participants had a reliable reduction on these subscales [18], although only those with elevated baseline guilt were included and cell sizes were small ($n$'s $\leq$ 11). Another study showed that PE, eye movement desensitization and reprocessing (EMDR) [19], and relaxation all showed significant reductions on guilt with small effect sizes and no significant differences across treatments [20]. Several studies have found that pre-treatment guilt does not impact the efficacy of PE [20,21]. In fact, there is some evidence that higher guilt is associated with slightly better PTSD outcomes for reasons that remain unclear [22••,23]. One possibility is that the relationship between guilt and superior treatment response is accounted for by initial PTSD severity.

## Anger

Anger is an emotional state associated with specific cognitive distortions, subjective labeling, and physiological changes [24]. There is considerable evidence that anger is associated with PTSD severity in individuals with PTSD [25]. A meta-analysis by Orth and Wieland [26] found a large effect size between PTSD and anger and found that this relationship was stronger among individuals exposed to military trauma than to civilian samples. A more recent meta-analysis by Olatunji *et al.* [27] found that PTSD was associated with greater anger difficulties than any of the anxiety disorders.

One explanation of the anger-PTSD relationship is that PTSD patients have a lower threshold for threat perception which triggers a biologically prepared 'survival mode,' which includes the activation of anger [28]. Indeed, veterans with PTSD exhibited anger more quickly and showed greater increases in heart rate and diastolic blood pressure during an anger task compared to veterans without PTSD [29]. Another explanation is that anger represents a strategy for avoiding more distressing trauma-related emotions such as fear [30]. This latter hypothesis has also received empirical support [31] and is not mutually exclusive with the survival mode hypothesis. Longitudinal studies have yielded inconsistent results with some showing that PTSD symptoms predict subsequent anger [32] and some showing that anger predicts later PTSD [31]. Thus, the causal mechanisms underlying the anger-PTSD relationship have not been identified.

Very few studies have examined the impact of PTSD treatment on anger. One study found that PE did not significantly reduce state anger [30], whereas another study found that PE, stress inoculation training (SIT) and PE/SIT all significantly reduced state anger [33]. Responders and nonresponders (defined as PTSD-negative and PTSD-positive diagnostic status, respectively) to CPT both showed reductions in state anger, but responders showed greater decreases in trait anger and control over one's anger than nonresponders [34•]. More research on the impact of PTSD treatment on different dimensions of anger is needed before clear conclusions can be drawn.

Results of studies examining the impact of anger on the efficacy of PTSD treatment are also inconsistent. Pre-treatment anger had a small negative impact on treatment outcomes for female sexual assault survivors receiving PE [30], combat veterans receiving group cognitive-behavioral therapy [35], veterans receiving CPT [36] and civilians with mixed trauma receiving individual cognitive-behavioral therapy [37], as well as higher PE dropout for female sexual assault survivors [23]. Owens *et al.* [38] found that veterans with high anger and PTSD severity were less likely to respond to CPT. Other studies, all with civilian samples, have found that anger does not predict PTSD outcomes following PE, SIT, or PE/SIT [21,33], exposure therapy, EMDR, or relaxation [39] and does not predict PE dropout [21]. One study of veterans found that greater anger at pre-treatment predicted better outcomes following CPT [40]. Thus, it remains somewhat unclear whether anger interferes with the effectiveness of PTSD treatments. Forbes *et al.* [41] proposed that anger could impede PTSD recovery if individuals avoid engaging with trauma-memories due to fear that it will trigger anger and aggression. Indeed, one study found that fear of anger mediated the negative effect of anger on PTSD outcomes [35]. Future studies should include measures of fear of anger (e.g. [42]) in addition to anger severity.

## Disgust

Disgust involves a rejection or revulsion response aimed to distance oneself from a potentially harmful or noxious stimulus [43], and it is increasingly recognized as a common peri-traumatic and post-traumatic emotion. Disgust has been associated with PTSD in women with a history of childhood sexual abuse [44,45], Vietnam veterans [46], witnesses of a catastrophic train crash [47], and in women with mixed trauma [48]. The only longitudinal study of disgust and PTSD to date found that soldiers reporting elevated peri-traumatic disgust later had significantly greater PTSD severity, even when controlling for peri-traumatic fear [49]. This suggests that disgust reactions during a trauma may predict PTSD development. Researchers have suggested that exposure treatments are less effective in reducing disgust among individuals with

anxiety disorders [50]. However, Badour and Feldner [51•] found that disgust and trauma-related anxiety declined at a similar rate during a single session of imaginal exposure and that reduction in disgust did not predict change in PTSD symptoms (although change in PTSD symptoms was minimal during this single session intervention). In sum, little is known about the impact of PTSD treatment on disgust and vice versa.

## Emotion regulation difficulties

Emotion regulation (ER) refers to the ability to manage the internal experience of emotions and the external expression of emotions [52]. PTSD has been associated with the tendency to over-utilize relatively ineffective ER strategies, and under-utilize relatively effective ER strategies [53]. Moreover, a number of prospective studies indicate that ER difficulties hinder recovery from PTS symptoms post trauma [54•]. Patterns of ER in PTSD also shed light on commonly observed emotional and behavioral correlates of PTSD, including impulsive aggression [55] and dissociation [56].

Several specific ER strategies have been linked with lower PTSD severity, including acceptance (i.e. embracing an emotional reaction without defensiveness or secondary negative emotions) [57], cognitive reappraisal (i.e. altering the meaning of an experience to change its emotional impact) [58], and problem solving (i.e. brainstorming and attempting planned solutions) [59]. Other ER strategies have been associated with greater PTSD severity prospectively, including rumination (i.e. recurrent, repetitive thoughts focusing on negative emotions) [60] and emotional suppression (i.e. inhibiting the expression of an emotional reaction) [60]. A recent meta-analysis found large effect sizes between PTSD severity and general emotional dysregulation, rumination, and suppression, and avoidance [61••].

ER difficulties have been considered a key feature of complex PTSD (CPTSD) [62]. CPTSD is a new nosological entry proposed by theorists who argue that current PTSD criteria do not account for the complexity of symptoms observed in survivors of prolonged trauma such as childhood sexual abuse [63]. Indeed, CPTSD was distinguished from PTSD on the basis of emotion dysregulation, negative self-concept, and interpersonal problems [64]. However, a review by Resick *et al.* [65] concluded that CPTSD currently lacks sufficient support to be recognized as a diagnosis. The conceptual and clinical utility of CPTSD continues to be debated.

In terms of treatment outcomes, several studies to date have shown that ER improves following ER-focused CBT [58,66,67], and non-ER-focused treatment such as supportive counseling treatment with imaginal exposure, written exposure therapy, PE, and sertraline [60,66,68•]. Boden *et al.* [58] found that reductions in expressive suppression, but not increases in cognitive reappraisal, predicted PTSD outcomes, whereas Wisco *et al.* [69] found that reappraisal was associated with less improvement in PTSD symptoms for those receiving WET. In summary, most PTSD treatments seem to impact ER strategies, but it is not clear whether use of certain strategies improves or worsens PTSD outcomes.

## Conclusions and future directions

Links between shame, guilt, anger, disgust and PTSD have been well established. Whether these relationships are moderated by trauma type (e.g. anger among veterans, disgust among sexual assault survivors) is unclear, as most studies either have not tested this or have only sampled one specific trauma type. In general, more longitudinal research is needed to examine the temporal relationship between emotions and PTSD, particularly for shame and disgust. The recent additions to the DSM criteria help to recognize the breadth of emotional complexity associated with PTSD. However, they also complicate the study of negative emotions and PTSD by making it difficult to determine whether associations are inflated because of the presence of negative emotion items on PTSD scales. Future studies examining the relationship between PTSD and these emotions will need to be mindful of construct overlap. For example, studies have found that the relationship between anger and PTSD is not substantially reduced when anger-related items are removed from the PTSD measure [31,41], but this may or may not be true for other associated emotions.

Another issue relates to the need to modify existing evidence-based treatments for PTSD to optimally benefit PTSD sufferers with specific emotion profiles (e.g. providing exposure therapy to PTSD patients who endorse anxiety as a primary emotion, and alternate treatments to those who endorse sadness, anger, or disgust as primary [70•]) or those with deficits in ER skills (e.g. incorporating emotion regulation skills into existing PTSD treatments). On one hand, such modifications are consistent with recommendations for personalized treatment and may improve outcomes for PTSD patients who do not benefit sufficiently from existing treatments [21]. On the other hand, treatment modifications invariably involve additional components, which increase treatment length, cost, and may increase risk of drop out. Thus, additional research is needed to examine the utility of modifications to standard PTSD treatment on the basis of individual emotionality levels or emotion regulation profiles.

## Conflict of interest statement

Dr. Foa receives royalties from the sale of Prolonged Exposure Therapy for PTSD: Emotional Processing of Traumatic Experiences Therapist Guide, and Reclaiming your Life from a Traumatic Experience Workbook by Oxford University Press. She receives royalties from Bantam and Oxford University Press for book sales,