

The Relationship Between Emotion Dysregulation and Impulsive Aggression in Veterans With Posttraumatic Stress Disorder Symptoms

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Abstract

While Veterans in general are no more dangerous than the civilian population, Veterans with posttraumatic stress disorder (PTSD) have stronger associations with anger and hostility and certain forms of aggression, such as intimate partner violence, than civilians with PTSD. This is alarming because up to 21% of Veterans seeking Veterans Affairs (VA) health care are diagnosed with PTSD. Emotion regulation difficulties (emotion dysregulation) are also related to increased PTSD symptom severity and may play a role in aggressive behavior. Because the predominant form of aggression in PTSD appears to be the impulsive subtype, the authors sought to clarify the relationship between

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PTSD, emotion dysregulation, and impulsive aggression. We examined how emotion dysregulation influenced impulsive aggression in a Veteran sample ($N = 479$) seeking treatment for trauma sequelae. All Veterans completed measures that assessed demographic information, emotion dysregulation, aggression frequency and subtype, and PTSD symptoms. Men generally reported more aggression than women. The emotion dysregulation, aggression, and PTSD measures were significantly correlated. Two cross-sectional mediation models showed emotion dysregulation fully accounted for the relationship between PTSD and impulsive aggression (indirect path for men: $b = .07$, $SE = .026$, bias-correct and accelerated confidence interval [BCa CI] = [0.02, 0.13]; indirect path for women: $b = .08$, $SE = .022$, BCa CI = [0.05, 0.13]). PTSD can increase negative emotions yet does not always lead to aggressive behaviors. The ability to regulate emotions may be pivotal to inhibiting aggression in those with PTSD. PTSD interventions may benefit from augmentation with emotion regulation skills training.

Keywords

emotion regulation, aggression, posttraumatic stress disorder, Veterans

While Veterans in general are no more dangerous than the civilian population (Bradley, 2007), Veterans with posttraumatic stress disorder (PTSD) have stronger associations with anger and hostility (Orth & Wieland, 2006) and certain forms of aggression, such as intimate partner violence, than civilians with PTSD (Marshall, Panuzio, & Taft, 2005; Taft, Watkins, Stafford, Street, & Monson, 2011). The relationship between PTSD and aggression is alarming because up to 21% of Veterans seeking Veterans Affairs (VA) health care are diagnosed with PTSD (Gates et al., 2012), which is higher than the 8% to 12% prevalence rate in the general population (Norris & Slone, 2007). To be diagnosed with the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association [APA], 2000) PTSD diagnosis, a Veteran must have experienced or witnessed an event that involved actual or threatened death, serious injury, or threat to physical integrity while feeling fear, helplessness, or horror. Three symptom clusters must also be present: reexperience, avoidance/numbing, and hyperarousal. The *DSM-5* (APA, 2013) updated the PTSD criteria by refining the definition of trauma to include actual or threatened exposure to death, serious injury, or sexual violation. The emotional response of fear, helplessness, and/or horror has been deleted because not all who endure a traumatic event experience these emotions. The *DSM-5* also added a symptom cluster which

captures negative alterations in cognitions and mood. However, because many prevalence rates are still based on the *DSM-IV-TR*, this article uses the *DSM-IV-TR* definition of PTSD. Understanding the mechanisms of aggression in those with PTSD is imperative to be able to predict and prevent aggressive behavior.

Emotion Regulation

We conceptualize emotions and emotion regulation from the affective neuroscience perspective which states that neurologically based emotions (happiness, sadness, anger, fear, and disgust) allow humans to adapt to the environment by responding to internal (thoughts, sensations) and environmental stimuli (Harkness, 2009; Panksepp, 2008). Emotions motivate behavior, direct attention, and produce affective feelings (Ekman, 2007; Harkness, 2009). Although emotions are generally adaptive, they must be regulated, especially if they are too extreme, easily triggered, or have long durations (Cote, Gyurak, & Levenson, 2010; Gross, 2014; Harkness, 2009). They can be regulated through cognitive mechanisms, including changing one's interpretation of a situation or considering future consequences (Gross & John, 2003). A diminished capacity for emotion regulation (emotional dysregulation) is evident in many psychiatric conditions, including PTSD (Klemanski, Mennin, Borelli, Morrissey, & Aikins, 2012).

PTSD has traditionally been conceptualized as a disorder involving extreme fear (Friedman, 2013); however, people who experienced traumatic events often report other emotions, such as anger (Adler, Wright, Bliese, Eckford, & Hoge, 2008; Lapierre, Schwegler, & LaBauve, 2007) and disgust (Engelhard, Olatunji, & de Jong, 2011). Because people with trauma exposure can experience many trauma-related emotions, it is also possible that these individuals may have difficulty regulating a variety of emotions post trauma. Cross-sectional studies demonstrated that emotion regulation difficulties were associated with increased PTSD symptom severity (Klemanski et al., 2012; Tull, Barrett, McMillan, & Roemer, 2007). Longitudinal studies revealed that emotion dysregulation preceded PTSD symptoms and may have influenced the development of PTSD symptoms over time, rather than emotion dysregulation resulting from PTSD (Bardeen, Kumpula, & Orcutt, 2013).

Emotion dysregulation can take many forms including overregulation, when an individual consistently stops the emotional experience from occurring (avoidance) or underregulation when the individual cannot control behavioral reactions to the emotion (Robertson, Daffern, & Bucks, 2012). Rumination is an example of cognitive underregulation of an emotion, and

the interaction between PTSD and rumination was related to more risky behaviors in Veterans (Borders, McAndrew, Quigley, & Chandler, 2012). In addition, people who engage in more emotion-focused coping were more likely to develop PTSD than people who used problem-solving coping after a traumatic event (Brousse et al., 2011).

Aggression

Aggression, or behaviors intended to harm another person, can be conceptualized as a multidimensional construct, and several subtypes have been suggested (Barratt, Stanford, Kent, & Felthous, 1997; Stanford et al., 2003; Teten Tharp et al., 2011). In this article, we categorize aggression into two primary subtypes: impulsive and premeditated (Stanford et al., 2003). Impulsive aggression is described as emotionally charged, responsive, angry behavior that harms others (Stanford et al., 2003), similar but not identical to the concept of reactive aggression (Chase, O'Leary, & Heyman, 2001; Teten et al., 2010). Premeditated aggression is characterized as deliberate, instrumental, and planned prior to the act (Stanford et al., 2003), similar in overall concept to proactive aggression (Chase et al., 2001; Teten Tharp et al., 2010). Premeditated aggression is accompanied by positive emotions, such as seeking/joy, rather than anger (Panksepp, 2008). Impulsive aggressors can be distinguished from premeditated aggressors by poorer verbal skills, less verbal memory, less sensitive neural arousal levels for novel stimuli, and fewer *planned* aggressive acts (Barratt, et al., 1997). In addition, impulsive aggression acts decreased when aggressors were given anticonvulsant medications, whereas premeditated aggression acts did not (Barratt, Stanford, Felthous, & Kent, 1997).

Similar to emotion dysregulation, aggression has also been related to PTSD symptoms (Hellmuth, Stappenbeck, Hoerster, & Jakupcak, 2012; Renshaw & Kiddie, 2012; Sullivan & Elbogen, 2014; Teten, Schumacher, et al., 2010), chiefly the hyperarousal cluster (Elbogen et al., 2010). Path analyses demonstrated PTSD symptoms had direct relationships with both verbal and physical aggression (standardized coefficients = .16 - .21); however, PTSD symptoms had larger indirect effects on aggression via anger (standardized coefficients = .45 - .71; Hellmuth et al., 2012; Renshaw & Kiddie, 2012). Contrasting research demonstrated that when aggression was broken down into impulsive and premeditated subtypes, impulsive aggression but not anger predicted if an individual would have a PTSD diagnosis (Teten, Miller, et al., 2010). It is necessary to distinguish between the aggression types because different types have led to different PTSD outcomes. For example, while most Veterans with PTSD engage in impulsive aggression

(Teten, Miller, et al., 2010), the minority of Veterans who engage in appetitive aggression, or aggression inflicted for the purpose of experiencing violence-related enjoyment, were less likely to develop PTSD (Weierstall, Huth, Knecht, Nandi, & Elbert, 2012).

Current Study

Understanding the mechanisms of aggression is needed to be able to predict and prevent aggressive behavior. The current study examines if emotion dysregulation found in Veterans with PTSD symptoms relates to impulsive and premeditated aggression. Emotion dysregulation mediated the relationship between PTSD and impulsive behaviors in previous research (e.g., substance use; Weiss, Tull, Viana, Anestis, & Gratz, 2012), so we hypothesize that emotion dysregulation will mediate the relationship between PTSD symptoms and impulsive aggression in a cross-sectional sample of Veterans.

Method

Participants

Participants were Veterans seeking inpatient trauma-related treatment at a large VA Medical Center between December 2009 and July 2013. Veterans were referred from outpatient VA providers in the Veterans Integrated Service Network (VISN) 16 catchment area. Men's inclusion criteria included serving in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), or Operation New Dawn (OND). Because of the smaller frequency of women in the service, women in this sample could have served in any war era, including OEF/OIF/OND (44%), First Gulf War (24%), Vietnam (6%), or peacetime (26%). Additional inclusion criteria for men and women were lifetime PTSD diagnosis (meeting PTSD diagnostic criteria during some point of his or her life but not necessarily currently) and willingness to actively participate in group psychotherapy for 4 weeks on an inpatient unit. Exclusion criteria included being actively psychotic, medically unstable, in need of medical detoxification for alcohol or other substances, or requiring visual supervision to prevent suicide.

Measures

Emotion dysregulation was measured by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004, 2008) that assesses six emotion regulation problems: (a) Nonacceptance of Emotional Responses—how

likely one is to have secondary emotional responses to one's emotions, (b) Goals—difficulties engaging in goal-directed behavior when experiencing negative emotions, (c) Impulse Control Difficulties—difficulties controlling one's behavior when having negative emotional experiences, (d) Awareness—lack of attention and/or awareness of emotional experiences, (e) Strategies—belief that one's emotions are not likely to be regulated effectively, and (f) Clarity—deficiency in the ability to know which emotion one is experiencing. Items are scored based on how often the item applies to the person and range from 1 (*almost never*) to 5 (*almost always*), with higher scores reflecting more emotion dysregulation. A total score can also be computed and ranged from 36 to 180 in this sample. Internal consistency (alpha coefficient) were .91 (total score), .89 (Nonacceptance), .83 (Goals), .89 (Impulse), .76 (Awareness), .86 (Strategies), and .75 (Clarity).

PTSD symptoms were measured by the PTSD Checklist - Stressor Specific Version (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993) that examines how much the Veteran was bothered by *DSM-IV-TR* PTSD symptoms in the last month. Responses range from 1 (*not at all*) to 5 (*extremely*). Scores greater than 50 are suggestive of a PTSD diagnosis (Weathers, Keane, & Davidson, 2001). In the current sample, scores ranged from 17 to 85, and the internal consistency estimate (alpha) was .92. Aggression was measured with Impulsive/Premeditated Aggression Scales (IPAS; Stanford, 2011; Stanford et al., 2003). The IPAS categorizes aggression into impulsive (IA) and premeditated (PA) types. Responses range from 1 (*strongly disagree*) to 5 (*strongly agree*) and higher scores reflect more aggression. IA scores ranged from 10 to 50; PA scores ranged from 8 to 40. This sample met the full range for the IA and PA scales. The internal consistencies estimates (alpha) for the current sample were .83 for IA and .75 for PA. Because the IPAS measures type of aggression but not frequency of aggression, we examined a single self-report item from the Borderline Symptom List 23 Supplement (BSL-23; Bohus et al., 2009) to estimate the frequency of aggression in this sample. Participants indicated how often in the last 6 months, "I had outbreaks of uncontrolled anger or physically attacked others." Responses ranged from 0 (*not at all*) to 4 (*daily or more*).

Veterans self-reported demographics including war era (OEF/OIF/OND, Persian Gulf War, Vietnam, or peacetime); no female Veterans reported serving in more than one era. PTSD diagnosis was determined by the Clinician-Administered PTSD Scale (CAPS; Blake et al., 1990) with the Life Events Checklist assessing trauma exposure. Diagnostic variables, other than PTSD, were determined by a psychologist and psychiatrist conducting separate clinical interviews and then coming to consensus on each Veteran's diagnoses.

Procedures

Veterans ($N = 625$) were admitted to the treatment program, and a trauma-specialty psychologist or social worker assessed Veterans for lifetime prevalence of PTSD with the CAPS. Veterans not meeting current PTSD criteria often presented with subthreshold PTSD which has comparable outcomes with full PTSD in terms of aggression (Jakupcak et al., 2007), depression, and disability (Cukor, Wyka, Jayasinghe, & Difede, 2010). Veterans then completed a clinical interview with a psychologist and a self-report assessment packet within 48 hr of admission. Veterans were included in the study if they consented to the research proposal (52 did not consent) and completed all measures of interest (94 did not complete all measures), which reduced the sample from 625 to 479 Veterans (259 men and 220 women). The 93 Veterans who failed to complete all measures did not differ from the study's sample in terms of age, race, marital status, employment status, branch of service, number of deployments, years since discharge, borderline personality disorder (BPD) diagnosis, or on any mental health diagnosis except for having a lower frequency of non-BPD personality disorders (7%) than the study's sample (14%); $\chi^2(1, N = 573) = 4.19, p = .04$. The local university affiliated Institutional Review Board and VA Research and Development committee approved the study prior to data collection.

Statistical Analyses

Because men on average engage in higher rates of violence (U.S. Department of Justice, 2007), we wanted to identify sex differences in our sample, so we compared men and women on the BSL-23 item with a chi-square test. Sex differences on the DERS, PCL-S, and IPAS total and subtest scores were evaluated with independent-samples t tests. Homogeneity of variance between the sexes was violated for the DERS total and PCL-S total; therefore, we used adjusted degrees of freedom for the t tests. The assumption of normality was also violated on the PCL-S and IPAS because of positively skewed distributions, so the Mann-Whitney U test (a nonparametric test) was used to confirm that men and women were sampled from different distributions for each of the measures. Because military war experiences are related to stronger effect sizes between anger/hostility and PTSD than other types of traumas (Orth & Wieland, 2006), an independent-samples t test was conducted that compared female Veterans from OEF/OIF/OND with female Veterans from all other war eras on level of IA, as women were only officially allowed in combat during OEF/OIF/OND. An anonymous reviewer

suggested this additional analysis. Pearson correlations were used to analyze relationships between the measures, stratified by men and women.

We examined if emotion dysregulation (DERS total) was consistent with a hypothesis of mediation for the relationship between PTSD symptoms (PCL-S total) and impulsive aggression (IA) while controlling for demographic and diagnostic variables; *t* tests were used to compare Veterans with and without comorbid psychiatric diagnoses (i.e., substance use) on IA to determine covariates. The DERS total score was used in the mediation models because the majority of the DERS subscales were correlated with IA. We followed bootstrapping procedures outlined by Preacher and Hayes (2004, Figure 1). Bootstrapping takes random samples (with replacement) from the existing data to estimate the properties of the sampling distribution by creating thousands of smaller samples, ordering them into a bootstrap sample, and calculating the mediation on the newly created bootstrap sample. Bootstrapping controls for violations of normality and is a robust method to test mediation models. Therefore, bootstrapping was used to calculate the standard errors of parameter estimates and bias-correct and accelerated confidence intervals (BCa CIs) of the indirect effects. If the CIs do not contain 0, the effect is considered statistically significant (Preacher & Hayes, 2004). In this study, 10,000 bootstrap samples were used to calculate the indirect effects, and all coefficients were reported as unstandardized estimates. To account for the sex differences described above, two separate models were examined.

Results

Demographics and Descriptives

Demographic information is listed in Table 1. The most commonly endorsed ethnicity was Caucasian for men and women and the majority of Veterans served in the Army. About 44% of men and 74% of women were not currently married. Because it was a trauma-focused treatment program, all Veterans were assessed for and met lifetime PTSD criteria and most met criteria in the last month. The most common comorbid diagnoses were mood disorder, substance dependence, and alcohol dependence. Most women (64%) and 15% of men were diagnosed with BPD. Patterns of trauma differed between men and women, with most men experiencing combat trauma and most women experiencing sexual assault. Based on a single BSL-23 item, 49% of women and 65% of men endorsed having at least one episode of uncontrolled anger or physically attacking others in the past 6 months. In addition, 9% of women and 14% of men reported having uncontrolled anger

Table 1. Demographic Characteristics of Male and Female Treatment-Seeking Veterans.

	Men (<i>n</i> = 259)	Women (<i>n</i> = 220)
Mean age in years (<i>SD</i>)	30.80 (7.11)	41.04 (10.39)
Race (%; not mutually exclusive)		
Caucasian	68.5	45.8
African American	16.2	45.5
Asian	0.8	0.5
Hispanic/Latino/Latina	8.8	3.2
Multiracial	4.2	4.5
Other	1.5	0.5
Marital status (%)		
Married	45	26.7
Not married	54.2	71
Widowed	0.8	2.3
Employment status (%)		
Employed	12.3	23.1
Unemployed	57.3	37.7
Disabled	23.8	32.3
In school	5.4	5.5
Retired	0	0.9
Branch of service (%)		
Army	61.5	64.1
Air force	5.0	11.4
Coast guard	0	0.9
Marines	18.5	12.9
Navy	11.2	10.8
Unknown	2.0	0.9
Psychiatric diagnoses (%)		
mTBI	23.1	10.9
PTSD	93.5	92.3
Borderline personality disorder	15.4	64.1
Other personality disorder	21.5	4.5
Major depression	74.2	65.0
Alcohol abuse/dependence	50.4	38.6
Substance abuse/dependence	56.2	32.3
Bipolar disorder	2.7	6.8
Type of trauma experienced (%)		
Physical assault	69	81
Sexual assault	16	85
Combat	93	37
Saw sudden unexpected death	47	24

(continued)

Table 1. (continued)

	Men (n = 259)	Women (n = 220)
Ever been deployed to combat zone (%)	96.9	35.9
Number of deployments to combat zones (M)	1.59 (0.89)	0.65 (0.88)
Years since discharge (M)	3.71 (2.89)	12.08 (10.86)
Veterans who had anger outbreaks or physically attacked others over the past 6 months (%)		
Not at all	35.4	49.1
Once	13.5	16.8
2-3 times	18.1	12.3
4-6 times	19.6	13.2
Daily or more	13.5	8.6

Note. mTBI = mild traumatic brain injury; PTSD = posttraumatic stress disorder.

or aggression at least once daily. A statistically significant chi-square demonstrated that a larger proportion of men engaged in impulsive aggression over the past 6 months than did women, $\chi^2(4, N = 479) = 14.30, p = .006$. An independent-samples *t* test showed OEF/OIF/OND female Veterans ($n = 97, M = 33.68, SD = 7.42$) did not differ on level of IA from female Veterans from other war eras or peacetime ($n = 123, M = 31.84, SD = 7.94$), $t(218) = 1.76, p = .08, d = .24$.

The total and subtest scores for the DERS, IPAS, and PCL-S were stratified by sex (Table 2). Men were statistically higher on the DERS Awareness, DERS Impulse Control Difficulties, IA, PA, and PCL-S total scores. Women were higher than men on DERS-Nonacceptance. All effect sizes (Cohen's *d*) were small. Distributions of scores on the DERS, IPAS, and PCL-S were positively skewed; thus, the Mann-Whitney *U* (a nonparametric test) was used to confirm sex differences. All sex differences identified by the *t* tests remained significant ($p < .05$).

Table 3 displays correlations between the measures with men above the diagonal and women below the diagonal. Correlations ranged from small to large, with a similar pattern for men and women. For men and women, IA correlated highest with DERS Impulse Control Difficulties (men, $r = .32$; women, $r = .52$). PA correlated highest with DERS Clarity for the men ($r = .17$) and DERS Impulse ($r = .30$) for the women. For women, IA significantly correlated with all three PCL-S symptom clusters ($r = .16-.33$). For men, IA only correlated with the hyperarousal symptom cluster ($r = .17$).

Table 2. Emotion Dysregulation, Aggression, and PTSD Symptom Scores for Male and Female Veterans.

	Men		Women		<i>t</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
DERS	112.73	24.03	111.92	26.41	0.35	.03
DERS-Non	16.42	6.44	18.04	6.86	-2.66**	.24
DERS-Goal	18.21	4.63	18.12	4.62	0.21	.02
DERS-Impu	19.10	6.22	17.90	6.22	2.11*	.19
DERS-Awar	19.38	5.12	18.35	5.14	2.20*	.20
DERS-Strat	24.52	7.18	24.33	7.91	-0.27	.03
DERS-Clar	15.16	4.07	15.19	4.46	-0.06	.00
IPAS-IA	34.92	7.70	32.65	7.75	3.20**	.29
IPAS-PA	22.44	6.02	21.01	5.89	2.60*	.24
PCL-S Total	66.73	11.88	64.01	13.60	2.33*	.21

Note. DERS = Difficulties in Emotion Regulation Scale; DERS-Non = Nonacceptance of Emotions; DERS-Goal = Difficulties Engaging in Goal-Directed Behavior; DERS-Impu = Impulse Control Difficulties; DERS-Awar = Lack of Emotional Awareness; DERS-Strat = Lack of Emotion Regulation Strategies; DERS-Clar = Lack of Clarity of Emotions; IPAS = Impulsive/Premeditated Aggression Scales; IA = Impulsive Aggression; PA = Premeditated Aggression; PCL-S = PTSD Checklist; PTSD = posttraumatic stress disorder.

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

Mediation Models

The *t* tests showed Veterans with specific trauma types (sexual trauma, combat, physical assault, seeing death), mood disorder, bipolar disorder, psychotic disorder, mild traumatic brain injury, BPD, and other Axis II diagnoses did not have higher IA scores than Veterans without these traumas or diagnoses. Veterans with diagnoses of alcohol use/dependence, $t(477) = 3.31, p = .001, d = .31$; substance use/dependence, $t(477) = -3.28, p = .002, d = .30$; and men, $t(477) = 3.20, p = .001, d = .29$ were statistically higher on IA than Veterans without these characteristics. Age had a small negative relationship with IA scores ($r = -.20, p < .001$). Alcohol use/dependence, substance use/dependence, and age were entered as covariates in the models; men and women had different levels of impulsive aggression and were examined in different models.

The mediation models tested whether emotion dysregulation (DERS total) produced results consistent with mediation for the relationship between PTSD symptoms (PCL-S total) and IA when controlling for alcohol use/dependence, substance use/dependence, and age (Table 4). For men, emotion dysregulation

Table 3. Pearson Correlations Between Study Measures for Male (Above Diagonal) and Female (Below Diagonal) Veterans.

	IA	PA	PCL-S	PCL-re	PCL-av	PCL-hy	DERS-DERS	DERS-Non	DERS-Goal	DERS-Impu	DERS-Awar	DERS-Strat	DERS-Clar
IA	1	-.03	.13*	.08	.12	.17**	.25**	.26	.23**	.32**	-.04	.15*	.12
PA	.37**	1	.14*	.16*	.14*	.06	.12*	.00	.05	.12	.07	.14*	.17**
PCL-S	.26**	.07	1	.90**	.91**	.87**	.47**	.39**	.41**	.43**	.00	.42**	.26**
PCL-re	.16*	.08	.87**	1	.71**	.70**	.38**	.33**	.31**	.36**	.03	.32**	.23**
PCL-av	.23**	.05	.91**	.39**	1	.71**	.46**	.38**	.40**	.40**	.01**	.42**	.30**
PCL-hy	.33**	.06	.78**	.52**	.60**	1	.40**	.34**	.40**	.41**	-.04**	.39**	.13**
DERS	.46**	.26**	.39**	.21**	.39**	.41**	1	.72**	.81**	.79**	.32**	.89**	.62**
DERS-Non	.34**	.18**	.33**	.23**	.30**	.31**	.80**	1	.49**	.46**	-.03	.65**	.32**
DERS-Goal	.38**	.12	.34**	.18**	.33**	.38**	.77**	.51**	1	.71**	.05	.74**	.36**
DERS-Impu	.52**	.30**	.36**	.24**	.29**	.43**	.78**	.57**	.59**	1	.05	.71**	.29**
DERS-Awar	.14*	.15*	.09	-.03	.16*	.06	.52**	.25**	.24**	.17**	1	.08	.37**
DERS-Strat	.39**	.25**	.37**	.21**	.36**	.39**	.88**	.65**	.70**	.70**	.27**	1	.45**
DERS-Clar	.25**	.14*	.22**	.05	.26**	.22**	.65**	.42**	.41**	.30**	.59**	.40**	1

Note. Men are above the diagonal and women are below the diagonal. IA = Impulsive Aggression; PA = Premeditated Aggression; PCL-S = PTSD Checklist; PTSD = posttraumatic stress disorder; PCL-re = reexperiencing symptoms; PCL-av = avoidance symptoms; PCL-hy = hypervigilant symptoms; DERS = Difficulties in Emotion Regulation Scale; DERS-Non = Nonacceptance of Emotions; DERS-Goal = Difficulties Engaging in Goal-Directed Behavior; DERS-Impu = Impulse Control Difficulties; DERS-Awar = Lack of Emotional Awareness; DERS-Strat = Lack of Emotion Regulation Strategies; DERS-Clar = Lack of Clarity of Emotions.

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

Table 4. Summary of Mediation Analyses of PTSD Symptoms Predicting Impulsive Aggression Through Emotion Dysregulation (10,000 Bootstrap Samples).

IV	MV	DV		Effect of	Effect of	Direct	Indirect Effect		Total
				IV on M (a)	M on DV (b)		Effect (c')	(a × b)	
PCL-S total	DERS total	Impulsive aggression	Men:	.970**	.074**	.015	.072	[0.026, 0.126]	.086*
			Women:	.725**	.126**	.056	.091	[0.054, 0.144]	.151**

Note. All coefficients are reported as unstandardized estimates. PTSD = posttraumatic stress disorder; IV = independent variable; MV = mediating variable; DV = dependent variable; CI = confidence interval; PCL-S = PTSD Checklist; DERS = Difficulties in Emotion Regulation Scale.

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

produced results consistent with mediation in the relationship between PTSD symptoms and IA, indirect path: $b = .07$, $SE = .026$, BCa CI = [0.02, 0.13]. The direct path between PTSD symptoms and IA was not significant after controlling for emotion dysregulation, $b = .02$, $SE = .05$, BCa CI = [-0.08, 0.11]. Therefore, in this model emotion regulation difficulties fully mediated the relationship between PTSD symptoms and IA for men. The mediation model

for women was similar with a significant indirect effect of PTSD symptoms on IA through emotion regulation, $b = .09$, $SE = .022$, BCa CI = [0.05, 0.13], with the direct path no longer being statistically significant, $b = .06$, $SE = .04$, BCa CI = [-0.01, 0.14].

Because hyperarousal symptoms were most strongly correlated with IA for both men and women in this study and in previous studies (i.e., Elbogen et al., 2010), we ran additional analyzes to test if hyperarousal scores accounted for the mediation results. All hyperarousal symptoms were removed from the PCL-S total score and the mediation models were run again with the same methods and variables. For men, when hyperarousal symptoms were removed, the direct path between PTSD symptoms and IA was no longer significant, $b = -.09$, $SE = .05$, BCa CI = [-0.02, 0.20]. However, the indirect path between PTSD symptoms and IA through emotion dysregulation remained significant; indirect path for men: $b = .10$, $SE = .033$, BCa CI = [0.04, 0.17]. The direct path does not have to be statistically significant for an indirect effect to account for the relationship between two variables (A. F. Hayes, 2009). For women, the results replicated almost identically to the original mediation model with the direct effect being significant, $b = .15$, $SE = .05$, BCa CI = [0.06, 0.25], but clarified by the significant indirect effect showing emotion dysregulation fully mediated the relationship between PTSD symptoms and IA, $b = .09$, $SE = .028$, BCa CI = [0.05, 0.16].

Finally, to test if shared method variance between DERS Impulse Control Difficulties and IA (men: $r = .32$; women: $r = .52$) accounted for the significant mediation between the DERS, PCL-S, and IA, all DERS Impulse items were removed from the DERS total score. The mediation models replicated for both men (indirect path: $b = .05$, $SE = .023$, BCa CI = [0.01, 0.10]) and women (indirect path: $b = .07$, $SE = .021$, BCa CI = [0.04, 0.12]).

Discussion

This study examined PTSD, emotion dysregulation, and aggression in a Veteran sample seeking trauma-related treatment. Our first finding showed significant relationships between emotion dysregulation, aggression, and PTSD variables of interest. Emotion dysregulation and PTSD symptoms correlated with small to moderate effect sizes (Cohen, 1988), providing additional evidence for the relationship between emotional dysregulation and PTSD. IA significantly correlated with PTSD total symptoms. For men, this relationship was accounted for by the association between hyperarousal symptoms and IA. For women, all PTSD symptom clusters were related to IA. For both sexes, IA showed the strongest relationship with DERS impulse control difficulties, providing convergent validity for the two scales. Of note,

PA correlated with three (men) and six (women) of the seven emotion dysregulation variables, suggesting those who engaged in planned aggression may also have difficulty regulating emotions. This finding is consistent with previous research that showed those who engaged in PA were not less impulsive or angry than those who engaged in IA (Barratt et al., 1997), but impulsive aggressors had poorer verbal skills, less sensitive neural arousal levels for novel stimuli, and fewer planned aggressive acts (Barratt et al., 1997; Miller, Collins, & Kent, 2008).

The most important finding was that emotion dysregulation fully accounted for the relationship between PTSD symptoms and IA for men and women. These results are consistent with a hypothesis of mediation, although mediation cannot technically be tested with cross-sectional data. PTSD symptoms and emotion dysregulation independently predicted IA in this model. However, when considered simultaneously, the indirect path of PTSD symptoms *through* emotion dysregulation best accounted for the relationship between PTSD and IA. Additional mediation analyses demonstrated that these results were not explained purely by the hyperarousal symptom cluster or by the conceptual overlap between DERS Impulse Control Problems and IA. Our results suggest it was the failure to regulate one's emotions that was related to IA in this sample of Veterans with PTSD symptoms. The difference between feeling negative emotions related to PTSD and acting aggressively is an important distinction because it is generally the behaviors (e.g., partner violence) that are related to poor adaptive functioning (Taft, Creech, & Kachadourian, 2012).

The recently released *DSM-5* incorporated persistent negative emotional states (changes in cognition and mood cluster) along with irritable behavior and angry outbursts (hyperarousal cluster), which may take the form of verbal and physical aggression, as PTSD diagnostic criteria (APA, 2013). These criteria are not dependent on one another, appropriately allowing for the emotion without the aggression. Our findings suggest emotion regulation likely makes the difference between having PTSD and acting aggressively while having PTSD.

Finding that emotion dysregulation accounted for the relationship between PTSD symptoms and IA leads to potential clinical implications. Veterans with PTSD have heightened neural and physiological responses to trauma-related and neutral stimuli, indicating that they have trouble distinguishing between safe and potentially unsafe (trauma-related) people and places (Weber, 2008). If Veterans are continuously interpreting environmental events and people as dangerous, then emotion regulation resources may be overtaxed and anger may be more difficult to control (Robertson et al., 2012). This theory is consistent with our finding that hyperarousal symptoms were most related to IA, perhaps because Veterans perceive the environment as

dangerous. Providing emotion regulation training prior to or in conjunction with PTSD treatments may assist Veterans in managing hypervigilance, daily stress, and anger, allowing for more energy to be concentrated on trauma processing (Bryant et al., 2013). Treatments that focus on emotional awareness, emotional acceptance, and a variety of emotion regulation strategies may be of particular benefit. Psychological treatment options include Skills Training in Affect and Interpersonal Regulation (Cloitre, Koenen, Cohen, & Han, 2002), Acceptance and Commitment Therapy (S. C. Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), and Dialectical Behavioral Therapy (Linehan, 1993). The extant research shows that emotion regulation training can reduce general negative affect and anger (Cloitre et al., 2002) and improve emotion regulation abilities (Hinton, Hofmann, Pollack, & Otto, 2009).

Because on average men and women display different emotion regulation tendencies (Nolen-Hoeksema, 2012), psychological treatments may need to be altered depending on the Veteran's sex. Women are more likely to report using both adaptive and maladaptive emotion regulation strategies, and have higher rates of anxiety and depression. Higher rates of anxiety and depression in women may be explained by an increased use of rumination, which is also related to higher rates of anxiety and depression. Decreasing rumination and increasing *context-appropriate* emotion regulation strategies may be particularly helpful for women. Men are more likely to use substances to regulate emotions (Nolen-Hoeksema, 2012). Assessing for substance use and, if indicated, providing concurrent substance use treatment may help male Veterans cope with PTSD-related emotions.

Male and female Veterans may also benefit from education about how military service and trauma exposure can influence emotion regulation. For example, there are lay beliefs that negative emotions are "bad" to experience (Tamir, 2011); however, emotions are generally adaptive and assist individuals in adjusting to the environment (Izard & Cohen, 1989). Humans will use emotions, even ones that are unpleasant, to reach their goals (Tamir, 2011). An ideal example is how the military uses anger to continue on combat missions that generally produce fear (Grossman, 1996; Hoge, 2010). Reminding the Veteran that quick threat appraisal and anger reactions were adaptive and valued in combat may help reduce the stigma associated with PTSD and related emotions and increase his or her awareness and acceptance of all emotions.

Limitations and Future Research

The generalizability of these findings to non-Veteran and less psychiatrically severe samples needs to be explored. The high incident rate of BPD amplifies the severe pathology of this sample but remains consistent with other studies

of VA residential PTSD treatments (Walter, Bolte, Owens, & Chard, 2012). Future research that supplements self-reported information with corroborative information about aggressive outbursts would be beneficial. In addition, the cross-sectional and correlational methods used in this study do not allow causal statements to be made. Longitudinal studies can examine if emotion regulation precedes aggression or if repeatedly engaging in aggressive acts leads one to more emotional dysregulation. A major strength of this article was the roughly equal amounts of men and women Veterans, which is rare due to the larger percentage of men serving in the military (Veterans Health Administration, 2013), although limited by the female mixed era sample. Another strength was the Veteran sample specifically chosen to study emotion dysregulation, PTSD, and aggression because of the high rates of each of these in Veterans seeking inpatient PTSD treatment.

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Authors' Note

The views expressed in this article are those of the authors and do not necessarily reflect the views, position, or policy of the Department of Veterans Affairs, the South Central MIRECC, Baylor College of Medicine, or the U.S. government.

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