Anger, Hostility, and Aggression Among Iraq and Afghanistan War Veterans Reporting PTSD and Subthreshold PTSD

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Iraq and Afghanistan War veterans were grouped by level of posttraumatic stress disorder (PTSD) symptomatology and compared on self-report measures of trait anger, hostility, and aggression. Veterans who screened positive for PTSD reported significantly greater anger and hostility than those in the subthreshold-PTSD and non-PTSD groups. Veterans in the subthreshold-PTSD group reported significantly greater anger and hostility than those in the non-PTSD group. The PTSD and subthreshold-PTSD groups did not differ with respect to aggression, though both groups were significantly more likely to have endorsed aggression than the non-PTSD group. These findings suggest that providers should screen for anger and aggression among Iraq and Afghanistan War veterans who exhibit symptoms of PTSD and incorporate relevant anger treatments into early intervention strategies.

A recent meta-analysis revealed a strong relationship between PTSD and anger and PTSD and hostility among trauma-exposed adults (Orth & Wieland, 2006). Larger effect sizes were associated with combat exposure (compared to other traumatic events) and a greater period of time since trauma exposure. Among Vietnam veterans,
research has consistently found that levels of anger and hostility are greater among veterans with PTSD compared to veterans without PTSD (e.g., Beckham, Feldman, Kirby, Hertzberg, & Moore, 1997; Castillo, Fallon, Baca, Conforti, & Qualls, 2001; Frueh, Henning, Pellegrin, & Chobot, 1997; Kubany, Gino, Denny, & Torigoe, 1994), even after accounting for combat exposure, substance abuse, or comorbid mental health disorders (Chemtob, Hamada, Roitblat, & Muraoka, 1994; Lasko, Gurvits, Kuhne, Orr, & Pitman, 1994; Novaco & Chemtob, 2002).

Although anger is a diagnostic criterion for PTSD, research indicates that the relationship between anger and PTSD is not an artifact of measurement overlap. Posttraumatic stress disorder symptom severity has been significantly correlated with multiple measures of anger after anger items were removed from the PTSD measures (Lasko et al., 1994; Novaco & Chemtob, 2002). In a study with combat veterans, severity of anger symptoms at intake did not covary with changes in PTSD symptoms following treatment, unlike baseline measures of anxiety, depression, and substance use (Forbes, Creamer, Hawthorne, Allen, & McHugh, 2003). These findings prompted the researchers to suggest that anger is independent from, albeit related to, PTSD. The consistent relationship between anger and PTSD may exist because anger functions to facilitate emotional disengagement (Foa, Skekete, & Rothbaum, 1989; Jaycox & Foa, 1996) and therefore may play a role in the formation and maintenance of PTSD. Indeed, higher initial anger levels predict later PTSD severity (Andrews, Brewin, Rose, & Kirk, 2000; Feeny, Zoellner, & Foa, 2000; Koenen, Stellman, Stellman, & Sommer, 2003; Riggs, Dancu, Gershuny, Greenberg, & Foa, 1992) and poorer treatment outcome (Foa, Riggs, Massie, & Yarczower, 1995; Forbes et al., 2003; Pitman et al., 1991; Riggs et al., 1992; Taylor et al., 2001).

In addition to documenting the relationship between PTSD and anger and between PTSD and hostility, numerous studies have found that veterans with PTSD are more likely to commit aggressive acts than veterans without PTSD or the general public (e.g., Beckham et al., 1997; Kulka et al., 1990; Lasko et al., 1994; McFall, Fontana, Raskind, & Rosenheck, 1999). In one study, Vietnam combat veterans with PTSD reported an average of 20 acts of violence in the past year compared to less than 1 act reported by combat veterans without PTSD (Beckham et al., 1997). In another study, veterans receiving inpatient PTSD treatment were approximately 7 times more likely than non-PTSD veterans receiving inpatient psychiatric care to have committed aggression in the 4 months prior to treatment (McFall et al., 1999). There is also evidence that veterans with PTSD are more prone than veterans without PTSD to express hostility and physical aggression within their intimate relationships (Carroll, Rueger, Foy, & Donahoo, 1985; Glenn et al., 2002; Jordan et al., 1992).

Despite the consistent relationships found between PTSD and anger, PTSD and hostility, and PTSD and aggression, much of the extant research has focused on the experiences of Vietnam combat veterans assessed decades after their military service. With a growing number of combat veterans returning from deployments in Iraq and Afghanistan, additional research is needed to determine whether these relationships exist among this new cohort. Recent findings suggest high rates of post-deployment mental health disorders, including symptoms of PTSD experienced by approximately 10% to 20% of returning servicemen and service women (Hoge et al., 2004; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Vasterling et al., 2006), along with significant PTSD-related impairment in occupational functioning (Hoge et al., 2007). Furthermore, many Iraq and Afghanistan veterans may be suffering from subthreshold levels of PTSD. Previous research has found that subthreshold levels of PTSD are associated with significant impairment (Mylle & Maes, 2004; Stein, Walker, Hazen, & Forde, 1997; Weiss et al., 1992; Zlotnick, Franklin, & Zimmerman, 2002) and may predict delayed onset PTSD (Carty, O’Donnell, & Creamer, 2006). Subthreshold levels of PTSD found in veterans have been shown to be associated with physical and mental health impairment, as well as limitations in occupational
and interpersonal functioning (Grubaugh et al., 2005; Kulka et al., 1990; Schnurr, Friedman, & Rosenberg, 1993; Weiss et al., 1992).

The current study sought to compare anger, hostility, and aggression, based on level of PTSD symptomatology, among treatment-seeking Iraq and Afghanistan War veterans. A retrospective review was conducted of self-report responses to clinical intake questionnaires assessing problemmatic alcohol use, combat exposure, PTSD, anger, hostility, and aggression. It was predicted that veterans who screened positive for PTSD would report significantly greater trait anger and hostility, and be more likely to have reported aggressive behavior than veterans reporting subthreshold and nonclinical levels of PTSD. It was also predicted that the veterans reporting subthreshold PTSD symptoms would report greater trait anger and hostility, and be more likely to have reported aggressive behavior than the non-PTSD group.

**METHOD**

**Participants**

The sample for this retrospective review study was comprised of consecutive Iraq and Afghanistan War combat veterans (N = 117), who presented with a variety of concerns to the Deployment Health Clinic of the VA Puget Sound Health Care System between May 2004 and June 2005. The University of Washington Human Subjects Division and the Veterans Administration Research and Development Committee approved the protocol for this study. Veterans who denied any combat exposure (n = 6) or who were missing responses to study variables (n = 6) were not included in the study.

The Deployment Health Clinic is structured to screen for and provide both physical and mental healthcare services to Iraq and Afghanistan War veterans within a primary care setting. Because the nature of the referral to the clinic was not assessed by the intake questionnaires, the reasons for seeking treatment are not available.

Most of the participants were men (97%) and White (71%), with a mean age of 32.7 (SD = 8.5) and 14.0 (SD = 2.3) years of education. Nearly one half of participants were married (49.6%), 34.8% single, and 13.0% divorced. Approximately one quarter (23.4%) of the sample reported a household income of $50,000 or more, 40.5% between $25,000 and $50,000, and 34% below $25,000. The majority (78.1%) reported serving in the Army or the National Guard, and 69.8% reported they were on reserve status when called to duty.

**Measures**

Combat exposure was assessed using the 10 items from Laufer’s Combat Exposure Scale (Laufer, Gallops, & Frey-Wouters, 1984) and 17 non-redundant items from the Desert Storm Trauma Questionnaire (see Southwick et al., 1993). On both surveys, respondents indicate (yes or no) whether they were exposed to a number of stressful combat-related events (e.g., witnessed injury or death, experienced sniper fire), and a summary score is calculated by summing the number of items positively endorsed. The Laufer Combat Exposure Scale has demonstrated good psychometric properties (Gallops, Laufer, & Yeager, 1981). Although no published psychometrics were found for the Desert Storm Trauma Questionnaire, the measure has been used to assess trauma in Gulf War I veterans and has previously demonstrated positive associations with PTSD symptom severity (Southwick et al., 1993). In the current study, internal consistency for the 27 items was good (α = .84).

Problem drinking was assessed using the Patient History Questionnaire (PHQ; Spitzer, Kroenke, & Williams, 1999), a self-report measure based on the clinician-administered Primary Care Evaluation of Mental Disorders (PRIME-MD; Spitzer et al., 1994). The PHQ includes five items that assess symptoms of alcohol abuse by asking respondents to indicate whether they have engaged in problematic behavior (e.g., drove an automobile while intoxicated) or experienced negative outcomes associated with alcohol consumption (e.g., failed to complete daily responsibilities due to alcohol use). Prior research suggests that the PHQ has good psychometric properties and is an effective screening measure for psychiatric conditions (Spitzer et al., 1999). In the current study, internal
consistency for the five PHQ alcohol items was adequate \((\alpha = .59; \text{see Nunnally, 1967).}\)

Posttraumatic stress disorder symptoms were assessed using the PTSD Checklist Military Version (PCL-M; Weathers, Litz, Herman, Huska, & Keane, 1993), a 17-item self-report instrument that asks respondents to rate the degree to which they have been bothered by symptoms of PTSD as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994) within the last month on a 5-point scale from 1 (not at all) to 5 (extremely). The instrument has demonstrated good psychometric properties (Weathers et al., 1993), and previous research supports the screening classification of PTSD in a combat veteran population using a global cut-off score of 50 or greater (Forbes, Creamer, & Biddle, 2001). The PCL-M scores ranging from 35 to 49 were classified as subthreshold PTSD; those who scored <35 were classified as non-PTSD (i.e., bothered no more than a little bit on any of the items). In the current study, internal consistency for the PCL-M was excellent \((\alpha = .97).\)

Anger was assessed using the Trait-Anger Scale (T-Anger Scale; Spielberger, Jacobs, Russel, & Crane, 1983), a 10-item subscale of the State-Trait Anger Expression Inventory (Spielberger, 1988) that assesses an individual's disposition to experience anger. Respondents rate the degree to which they react in an angry fashion from 1 (almost never) to 4 (almost always), and responses are summed for a global score. The T-Anger Scale has been shown to have good psychometric properties and there is good support for the measure's construct validity (Spielberger et al., 1983). In the current study, internal consistency for the T-Anger Scale was good \((\alpha = .90).\)

Hostility was assessed using the hostility subscale of the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983), which asks respondents rate the degree to which they engage in five hostile reactions on a 5-point scale from 0 (not at all) to 4 (extremely). Individual item scores are averaged for a global score. Overall, the BSI has demonstrated good psychometric properties, and there is good support for the construct validity of the measure, including the hostility subscale (Derogatis, 1993). In the current study, internal consistency for the subscale was good \((\alpha = .88).\)

Aggression was measured using four items that have been adapted from the National Vietnam Adjustment Study (see McFall et al., 1999). Respondents indicate whether they have engaged in behaviors including destroying property, threatening the use of violence (with and without a weapon), or physically assaulting another person. In the current study, internal consistency for the four items was adequate \((\alpha = .65).\)

**RESULTS**

**Preliminary Analyses**

Based on PCL-M scores, 47 veterans screened positive for PTSD \((M = 63.9, SD = 8.0), 21 were classified as subthreshold PTSD \((M = 42.7, SD = 4.6), and 49 were classified as non-PTSD \((M = 24.0, SD = 5.1). Scores on measures of combat exposure, trait anger, and hostility were linearly and normally distributed. Mean combat exposure scores for the PTSD, subthreshold-PTSD, and non-PTSD groups were 13.4 \((SD = 5.8), 13.0 \((SD = 5.1), and 8.9 \((SD = 5.5), respectively. Problem drinking and the summed aggression variables were significantly positively skewed. Efforts to transform the distributions of these variables were unsuccessful and therefore both measures were treated as dichotomous variables \((yes = 1, no = 0; \text{see Tabachnick & Fidell, 2001}), based on whether veterans endorsed at least one item on each measure. Over one half of the veterans in the PTSD-group (53.2%) and the subthreshold-PTSD group (52.4%) endorsed at least one act of aggression in the past 4 months, compared to 20.4% in the non-PTSD group; the modal number of aggressive acts for those who screened positive for aggression was one. Frequencies for specific aggressive acts are presented in Table 1.

Combat exposure, problem drinking, and demographic variables (age, race, education, and income) were examined as potential covariates by computing their associations with anger, hostility, and aggression. Age was significantly negatively associated with the dichotomous aggression variable,
Table 1. Number of Veterans Reporting Specific Aggressive Acts

<table>
<thead>
<tr>
<th></th>
<th>PTSD (n = 47)</th>
<th>Subthreshold PTSD (n = 21)</th>
<th>Non-PTSD (n = 49)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Destroyed property</td>
<td>9</td>
<td>19.1</td>
<td>5</td>
</tr>
<tr>
<td>Threatened physical violence (no weapon)</td>
<td>12</td>
<td>25.5</td>
<td>8</td>
</tr>
<tr>
<td>Threatened someone with a weapon</td>
<td>1</td>
<td>2.1</td>
<td>3</td>
</tr>
<tr>
<td>Had a physical fight with someone</td>
<td>8</td>
<td>17.0</td>
<td>2</td>
</tr>
</tbody>
</table>

Note. PTSD = Posttraumatic stress disorder.

\[ r = -0.19, \ p < .05, \text{ but was not significantly related to trait anger, } r = -0.13, \ ns, \text{ or hostility, } r = 0.08, \ ns. \]

No other significant associations emerged between demographic variables and anger, hostility, and aggression. Combat exposure was significantly positively associated with trait anger, \( r = 0.20, \ p < .05 \), and hostility, \( r = 0.18, \ p < .05 \), but was not significantly related to aggression, \( r = 0.14, \ ns \). Problem drinking was significantly positively associated with trait anger, \( r = 0.27, \ p < .01 \), hostility, \( r = 0.25, \ p < .01 \), and aggression, \( \chi^2(1, N = 117) = 5.85, \ p < .05 \). Only covariates significantly associated with the respective outcome variables were retained for further analyses (see Tabachnick & Fidell, 2001).

**Primary Analyses**

The results of an analysis of covariance (ANCOVA) indicated that, after accounting for combat exposure and problem drinking, the PTSD group variable significantly predicted differences in trait anger, \( F(2, 112) = 20.05, \ p < .01, \eta^2 = .26 \). Results of planned t-test analyses indicated that the PTSD-group reported significantly greater trait anger \( (M = 23.9, SD = 5.9) \) than both the subthreshold-PTSD group \( (M = 19.1, SD = 6.6, t(66) = 2.72, \ p < .01) \), and the non-PTSD group \( (M = 15.1, SD = 4.6, t(94) = 7.61, \ p < .01) \). In addition, the subthreshold-PTSD group reported significantly greater trait anger than the non-PTSD group, \( t(68) = 2.90, \ p < .01 \).

The results of a second ANCOVA indicated that, after accounting for combat exposure and problem drinking, the PTSD group variable significantly predicted differences in hostility, \( F(2, 112) = 42.80, \ p < .01, \eta^2 = .43 \). Results of planned t-test analyses indicated that the PTSD-group reported significantly greater hostility \( (M = 2.4, SD = .9) \) than both the subthreshold-PTSD group \( (M = 1.6, SD = 1.0, t(66) = 3.24, \ p < .01) \), and the non-PTSD group \( (M = .07, SD = .07, t(94) = 10.34, \ p < .01) \). In addition, the subthreshold-PTSD group reported significantly greater hostility than the non-PTSD group, \( t(68) = 4.61, \ p < .01 \).

A binomial logistic regression predicting aggression (yes or no) was conducted in which age and problem drinking were entered into the model as covariates at Step 1 and the PTSD group variable was entered into Step 2. There was a significant main effect for PTSD group. As shown in Table 2, veterans in the PTSD-group were more likely than the veterans in the non-PTSD group to have reported aggression. Veterans in the subthreshold-PTSD group were also more likely than the veterans in the non-PTSD group to have reported aggression. There was no significant difference in aggression comparing the PTSD and subthreshold-PTSD groups. To verify that findings from the ANCOVA and logistical regression were not artifacts of the PCL-M anger-related item, all analyses were rerun after omitting that item from the PTSD symptom severity variable; the significance and magnitude of the results did not change.

**DISCUSSION**

Results from the current study confirm the hypothesis that symptoms of PTSD are associated with anger, hostility,
Table 2. Results of a Binomial Logistic Regression of PTSD Group on Aggression (yes/no) Controlling for Age and Problem Drinking (N = 117)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Wald</th>
<th>df</th>
<th>Exp(B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>2.33</td>
<td>1</td>
<td>0.96</td>
<td>.92–1.0</td>
</tr>
<tr>
<td>Problem drinking</td>
<td>4.53*</td>
<td>1</td>
<td>0.38</td>
<td>.15–.93</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>2.02</td>
<td>1</td>
<td>0.95</td>
<td>.19–1.3</td>
</tr>
<tr>
<td>Problem drinking</td>
<td>3.72*</td>
<td>1</td>
<td>0.50</td>
<td>.91–1.0</td>
</tr>
<tr>
<td>PTSD group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. PTSD vs. non-PTSD</td>
<td>8.81**</td>
<td>1</td>
<td>4.17</td>
<td>1.6–10.7</td>
</tr>
<tr>
<td>2. PTSD vs. Subthreshold</td>
<td>&lt;1</td>
<td>1</td>
<td>1.17</td>
<td>.40–3.5</td>
</tr>
<tr>
<td>3. Subthreshold vs. non-PTD</td>
<td>7.12**</td>
<td>1</td>
<td>4.89</td>
<td>1.5–15.7</td>
</tr>
</tbody>
</table>

Note. PTSD = Posttraumatic stress disorder.  
* p < .05. ** p < .01

and aggression among Iraq and Afghanistan War veterans. Veterans who screened positive for PTSD reported greater trait anger and hostility and were more likely to have endorsed recent aggression than veterans who screened negative for PTSD. Likewise, veterans reporting subthreshold-PTSD symptoms indicated greater trait anger and hostility and were more likely to endorse recent aggression than the non-PTSD veterans. Although the PTSD-group reported significantly greater trait anger and hostility than the subthreshold-PTSD group, they were not more likely to report aggression. The nature of the results did not change after eliminating the anger item from the PTSD measure, thus replicating previous findings (e.g., Lasko et al., 1994; Novaco & Chemtob, 2002). This further supports the notion that the relationship between anger and PTSD is not a methodological artifact.

These results contribute to the research examining the relationship between PTSD and anger among combat veterans in two important ways. First, the strong associations between PTSD and anger, hostility, and aggression have been consistently demonstrated among Vietnam combat veterans, although assessment of these factors was conducted decades following military service (Beckham, Moore, & Reynolds, 2000). The current study suggests that anger, hostility, and aggression associated with symptoms of PTSD are present in Iraq and Afghanistan War veterans within the first few years after returning from combat duty and that these associations are significant even after accounting for other factors such as combat exposure and problem drinking. As such, early intervention may be particularly important in this population given that rates and severity of PTSD may increase over time (Gray, Bolton, & Litz, 2004; Southwick et al., 1995; Wolfe, Erickson, Shanksy, King, & King, 1999), along with the strength of the relationship between PTSD and anger (Orth & Wieland, 2006).

Second, this study confirms previous research indicating that subthreshold-PTSD is associated with clinically significant impairment among treatment-seeking Vietnam veterans (Grubaugh et al., 2005) and community members from an epidemiological sample (Stein et al., 1997). In the current study, veterans with subthreshold levels of PTSD symptoms had greater anger and hostility than veterans without PTSD and were just as likely to have endorsed aggression as were veterans who screened positive for PTSD. Although rates of PTSD among soldiers serving in the Iraq and Afghanistan Wars have been estimated to range from 10% to 20% (Hoge et al., 2004; Vasterling et al., 2006), an additional percentage of returning soldiers are likely experiencing subthreshold levels of PTSD symptoms, which may contribute to difficulties with anger and aggression. Clinicians may underestimate the impairment associated with subthreshold levels of symptoms and subthreshold-PTSD veterans may be less likely to seek mental health services than those with PTSD (Grubaugh et al., 2005). This has important implications for the Department of Veterans Affairs and community health care providers, underscoring the need to screen for symptoms of PTSD in settings.
Results from the current study should be considered in light of certain limitations. First, given the nature of the clinic from which the sample was drawn, we cannot infer whether veterans experiencing PTSD symptoms initially presented for medical concerns or were seeking treatment for mental health issues. This makes it difficult to choose relevant norms for comparing levels of self-reported PTSD, anger, hostility, and aggression. For example, trait anger scores among the PTSD and subthreshold-PTSD groups in the current study were lower than those reported by Vietnam combat veterans receiving outpatient PTSD treatment (Lasko et al., 1994), and rates of aggression among the PTSD and subthreshold-PTSD groups were lower than those reported by Vietnam combat veterans seeking inpatient PTSD treatment (McFall et al., 1999). However, direct comparisons between the current sample and previous samples are problematic without knowing why the current sample presented to the clinic. Second, the current study relied on self-report methodology to assess level of PTSD symptoms, although there are more detailed ways in which to assess subthreshold levels of PTSD (see Mylle & Maes, 2004). In addition, although the PCL-M has demonstrated good sensitivity and specificity for detecting PTSD based on structured clinical interviews (Forbes et al., 2001), other factors that may influence self-report of symptom severity were not assessed and therefore may have influenced results. For example, efforts to seek disability and compensation for PTSD were not considered, although these factors have been associated with inflated reports of symptom severity among veterans (Gold & Frueh, 1999). In addition, medical factors that may impact anger or aggression were not assessed, such as traumatic brain injury, the incidence of which is estimated to be prominent during military service in Iraq (Warden, 2006). Finally, the cross-sectional design of the current study makes it problematic to infer causality among the relationships between anger, hostility, aggression, and PTSD.

Prior research has also concluded that anger is an important symptom to address among Vietnam veterans with PTSD (Frueh et al., 1997; Koenen et al., 2003; McFall et al., 1999). The results of the current study suggest that introducing anger management skills should also be a priority in treating Iraq and Afghanistan War veterans with symptoms of PTSD. There is preliminary support for a brief four-session cognitive–behavioral anger management intervention among active duty military personnel, although attrition rates as high as 50% were noted (Linkh & Sonnek, 2003). In addition, anger management skills training has been found to improve anger control among Vietnam combat veterans with PTSD (see Chemtob, Novaco, Hamada, & Gross, 1997). Future research should investigate the effectiveness of these approaches with this new population of veterans, along with potential differential treatment outcome based on level of PTSD symptomatology. Research also should be devoted to examining possible factors that predict whether veterans will be at risk for experiencing subthreshold versus diagnostic levels of PTSD symptoms following combat. Level of combat exposure did not distinguish between veterans reporting subthreshold-PTSD and PTSD in the current study; however, other factors may include pre-existing trauma exposure (see Donovan, Padin-Rivera, Dowd, & Blake, 1996) or intelligence level (see Macklin et al., 1998).

It would also be helpful to examine whether results from the current study apply to female and minority veterans. One prior study examined the relationship between PTSD and hostility among female veterans and found that those with PTSD reported significantly higher levels of hostility than those without PTSD (Butterfield, Forneris, Feldman, & Beckham, 2000), but more attention to this population is needed as an increasing number of women are serving in combat-related roles in the military. In addition, several studies have indicated that minority veterans experience a more negative course of PTSD than do White veterans (Koenen et al., 2003; Kulkia et al., 1990), although racial differences specific to PTSD-related anger have not been explored. Prospective research using structured assessment interviews and larger, more diverse samples of Iraq and Afghanistan War veterans is needed to replicate these findings and to explore interactive effects that might exist between PTSD and other factors.
REFERENCES


