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## Correlates of Anger and Hostility among Iraq and Afghanistan War Veterans

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### Abstract

**Objective**—As troops return from Iraq and Afghanistan to civilian life, clinicians are starting to grapple with how best to detect those at risk of post-deployment adjustment problems. Data reveal the presence of mental health problems in these soldiers, including posttraumatic stress disorder (PTSD), head injury, and alcohol abuse. Each of these conditions has been associated with elevated anger and hostility in veterans from previous conflicts. The authors sought to identify variables empirically related to anger and hostility in Iraq and Afghanistan veterans.

**Method**—A total of 676 veterans who served since September 11, 2001, and who volunteered to participate in research studies, were interviewed with instruments designed to collect information on psychiatric symptoms, health, and possible post-deployment adjustment issues. The primary outcome measures were variables measuring aggressive impulses or urges, difficulty managing anger, and perceived problems controlling violent behavior.

**Results**—The three outcome measures were each significantly associated with PTSD hyperarousal symptoms. Other PTSD symptoms were less strongly and less consistently linked to anger and hostility. Traumatic brain injury and alcohol misuse were related to the outcome variables in bivariate but not multivariate analyses. Distinct sets of demographic, historical, and military-related variables were associated with the different facets of anger and hostility measured.

**Conclusions**—The results underscore the need to tailor interventions individually to address anger and hostility effectively and to develop theoretically sophisticated, evidence-based knowledge to identify service members at risk of problematic post-deployment adjustment.

As troops return from Iraq and Afghanistan to civilian life, clinicians are starting to grapple with how best to detect those at risk of post-deployment adjustment problems (1, 2). Data

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reveal the presence of mental health problems in these soldiers (2, 3), including posttraumatic stress disorder (PTSD) (4–8), alcohol abuse (9), and head injuries (2, 10–13). Each of these conditions has been shown to be associated with an elevated risk of anger, hostility, and even aggression in veterans from previous conflicts (14–23). Other risk factors include witnessing parental conflict (22), experience of child abuse (24), pre-deployment exposure to violence (25), and combat exposure (16). Research has been limited in certain respects, however, in that most studies were of male Vietnam veterans and were conducted more than 20 years after participants' combat experience. Differing enlistment methods, with the Vietnam War's draft and voluntary enrollment for the conflicts in Iraq and Afghanistan, would also suggest that the two cohorts are not entirely comparable with respect to pre-deployment demographic characteristics, possibly leading to variations in post-deployment adjustment problems.

As a result, it is unknown to what extent studies of Vietnam veterans apply to Iraq and Afghanistan veterans. To our knowledge, only a few studies have begun to empirically investigate anger and hostility in new soldiers returning from Iraq and Afghanistan. Preliminary findings suggest that Iraq and Afghanistan veterans with PTSD may tend to exhibit elevated levels of anger and hostility (26). Also, veterans who have been exposed to violent combat during deployment may be more likely than those who saw less severe violence to participate in risky behaviors after deployment, including physical aggression (27). No studies have examined the demographic, historical, military, and clinical characteristics associated with elevated anger and hostility in Iraq and Afghanistan veterans. Numerous questions remain: Do risk factors uncovered in studies of veterans from prior conflicts apply to current veterans? How does PTSD contribute to post-deployment anger and hostility in veterans? What role, if any, does combat exposure play in post-deployment anger and hostility? Are other military variables (e.g., length of deployment) linked to self-reported aggressiveness? Is prewar trauma or family history relevant? If so, in what ways? How is traumatic brain injury related to anger in returning veterans? Might loss of consciousness be a factor? Does alcohol misuse also elevate risk? In this study, we sought to address these questions by determining what factors are empirically associated with post-deployment anger and hostility reported by a sample of Iraq and Afghanistan veterans.

## Method

### Participants and Procedures

A total of 676 veterans completed the instruments described below as part of a multisite study conducted through the Department of Veterans Affairs (VA) Mid-Atlantic Mental Illness Research, Education, and Clinical Center (MIRECC). The MIRECC houses a research registry of veterans who served in the U.S. armed forces after September 11, 2001, and volunteered to be recruited for clinical studies. Veterans are initially recruited to the registry through mailings, advertisements, and clinician referrals. The advertisements and letters invite veterans to volunteer in a study evaluating “the effects of recent military deployments on the mood, emotions, and mental and physical health of military personnel” or “the effects of recent deployments on the physical and mental health of service members, especially as they transition from deployment back to civilian life.” Volunteers who meet inclusion criteria and complete informed consent procedures (which were approved by institutional review boards at multiple sites, including two in North Carolina [the Durham and Salisbury VA Medical Centers] and two in Virginia [the Hampton and Richmond VA Medical Centers]) are entered into the MIRECC registry. Participants answer a set of questions concerning psychiatric symptoms, health, and possible postdeployment adjustment issues. They are compensated \$175 for completing the assessments and are supplied with clinician referrals if appropriate. The cohort for the present study includes all the veterans

registered in the MIRECC at the time of data analysis (interviewed from May 2005 to September 2008) who completed measures described below.

### Measures

**Demographic Data:** Demographic variables included level of education (coded as either “high school or less” or “more than high school”), age, gender, marital status (“married” or “not currently married”), and race (white or nonwhite). Work status at the time of the interview (currently not working or currently working at least part time) was also assessed.

**Historical Factors:** Several variables related to premilitary background were examined. The Traumatic Life Events Questionnaire (28), which assesses exposure and response to traumatic events and has been used in veteran studies (29), was used to assess premilitary trauma exposure, including witnessing family violence while growing up and being a victim of child physical or sexual abuse. Veterans were asked questions about parental history of criminal arrests and parental history of severe mental illness (schizophrenia, bipolar disorder, and major depression) and about whether they themselves had ever been incarcerated.

**Military Variables:** Questions related to military experience included highest rank attained (1=W-1 or higher, including warrant officer), total number of months deployed to Iraq or Afghanistan (0=less than 1 year; 1=more than 1 year), and number of deployments to Iraq or Afghanistan. Combat exposure was measured using the Combat Exposure Scale (30), a 7-item Likert scale measuring wartime trauma exposure. Additional factors included firing weapons in a combat situation (0=no; 1=yes) and service status (Reserves or National Guard: 0=no; 1=yes).

**Clinical Factors:** PTSD symptoms were assessed using the Davidson Trauma Scale (31), in which the respondent rates the past-week frequency and severity of the DSM-IV PTSD symptoms of reexperiencing, avoidance and numbing, and hyperarousal related to a specific trauma. A score of 48 (possible scores=0–136) was set as the diagnostic cutoff for PTSD (0=scores 0–48; 1=scores >48); this cutoff is associated with a sensitivity of 0.82, a specificity of 0.94, and a diagnostic efficiency of 0.87 in designating the presence of PTSD in Iraq and Afghanistan veterans (32). To further verify that the Davidson Trauma Scale was diagnostically accurate in our sample, we analyzed a subset of participants (N=484) who were interviewed with the Structured Clinical Interview for DSMIV (33); based on receiver operating characteristics, the scale had an area under the curve of 0.90, connoting excellent screening ability for detecting PTSD.

Experience of war zone trauma was recorded if the participant’s most disturbing trauma on the Davidson Trauma Scale was clearly related to the war zone or if the participant answered affirmatively to the Traumatic Life Events Questionnaire questions “Were you ever exposed to warfare or combat? (For example, in the vicinity of a rocket attack or people being fired upon; seeing someone get wounded or killed)” and “Did you experience intense fear, helplessness, or horror when it happened?” Other clinical measures included the Alcohol Use Disorders Identification Test (34), which is a 10-item screen of alcohol misuse, with scores >7 indicating a high risk of alcohol abuse (0=scores 0–7; 1=scores >7). Traumatic brain injury during deployment was assessed by self-report (0=no; 1=yes); if positive, participants were asked if they had suffered loss of consciousness lasting at least 1 minute (0=no; 1=yes).

**Anger and Hostility:** Our primary outcome measure was ascertained using three different constructs. The Symptom Checklist– 90 hostility subscale (35), a six-item scale, asks

participants to rate items according to how distressing they were to the participant in the past week, ranging from 0 (not at all) to 4 (extremely). Statistical analyses of this subscale yielded two different constructs. Two items—“having urges to break or smash things” and “having urges to beat, injure, or harm someone”—had very good internal consistency (Cronbach alpha=0.85) and appeared to represent a single construct measuring aggressive impulses or urges (0=at or below median; 1=above median). The remaining four items—“Feeling easily annoyed or irritated,” “Temper outbursts that you could not control,” “Getting into frequent arguments,” and “Shouting or throwing things”—had similarly high internal consistency (Cronbach alpha=0.89) and appear to denote a second specific construct, namely, difficulty managing anger (0=at or below median; 1=above median). The third construct was based on the question “During the past 30 days, have you had trouble controlling violent behavior (that is, hitting someone)?” indicating perceived problems controlling violence (0=no; 1=yes).

**Statistical Analyses**—SAS, version 9.1 (SAS Institute, Cary, N.C.), was used for all analyses. Bivariate associations between outcome measures and putative factors were based on nonparametric Spearman correlation procedures; in some instances (including age, aggressive impulses or urges, and difficulty managing anger), skewed distributions were dichotomized at the median prior to analysis. Multivariate analyses assessing factors were conducted using logistic regression procedures for the three dependent measures of anger and hostility. For each, component variables (demographic, historical, military, and clinical) were subjected to stepwise deletion to obtain a reduced model; alpha was set at 0.05.

## Results

### Sample Characteristics

The sample was predominantly male (80%), with median age of 36 years. Table 1 summarizes the participants' demographic, historical, military, and clinical characteristics. The majority were married (55%) and reported having education beyond high school (54%); 44% were Caucasian, and 70% were currently employed. About one-fifth (19%) had a history of incarceration, and 8% reported having at least one parent with a criminal history. Forty percent reported that they had witnessed family violence, and one-third (34%) reported having been physically or sexually abused before age 18. One-quarter (26%) reported a family history of severe mental illness.

Within the military domain, 81% of the sample had served in a war zone in Iraq, Afghanistan, or Kuwait; 38% had fired a weapon in a combat situation; 27% reported having spent more than 1 year in Iraq or Afghanistan; and 27% were deployed more than once. Nine percent were officers, and 43% were in the Reserves or the National Guard. With regard to clinical factors, one-fifth (22%) reported a traumatic brain injury during combat, and 10% reported loss of consciousness as a result of the injury. Almost half (46%) of the sample met the cutoff score for PTSD on the Davidson Trauma Scale; of these, 86% specifically reported war zone trauma (the other 14% left the relevant items blank or listed traumas not related to the war zone) and 93% had served in a war zone. Nearly a quarter (23%) of the sample were at risk for alcohol misuse; of these, 68% met the cutoff score for PTSD on the Davidson Trauma Scale. Of the 9% who had experienced loss of consciousness related to head trauma, 70% met the cutoff score for PTSD.

### Outcome Measures

Descriptive analysis showed that 11.2% (N=76) of the sample perceived problems controlling violent behavior. Bivariate analyses between the three dependent measures revealed modest correlations between each for the entire sample. Having problems

controlling violence was significantly related to aggressive impulses ( $r=0.40$ ,  $df=1$ ,  $p<0.001$ ) and to difficulty managing anger ( $r=0.35$ ,  $df=1$ ,  $p<0.001$ ). The latter was significantly related to aggressive impulses ( $r=0.58$ ,  $df=1$ ,  $p<0.001$ ). Despite the overlap, these analyses suggest that unique factors within each measure were informative and indicative of different constructs.

Table 2 lists bivariate associations between independent and dependent variables. Most demographic variables were not associated with measures of anger and hostility. Age was inversely related to aggressive impulses but not to difficulty managing anger or problems controlling violence. Higher education and current employment were both protective against all three components of anger and hostility. Historical variables were more consistently related to anger and hostility. In particular, witnessing family violence, physical or sexual abuse before age 18, and having a family history of severe mental illness were significantly related to all constructs measured.

Component variables in the military domain showed mixed association with anger and hostility. Unrelated factors included redeployment and having served in the Reserves or the National Guard. Serving in a war zone, firing a weapon in a combat situation, longer deployments, and higher scores on the Combat Exposure Scale were significantly associated with each of the three outcome measures; higher rank was negatively associated with each.

Bivariate associations between clinical variables and measures of anger and hostility were robust and more consistent. Traumatic brain injury during deployment, loss of consciousness, meeting the cutoff score for PTSD on the Davidson Trauma Scale, and risk for alcohol misuse were significantly associated with each of the three dependent measures.

In Table 3, model 1, the reduced multivariate model regressing the measure for aggressive impulses or urges was statistically significant ( $\chi^2=279.11$ ,  $df=6$ ,  $p<0.001$ ), accounting for almost half of the variance (48%) as determined by a modified coefficient of determination. Statistically significant independent variables included having served in a war zone, abuse before age 18, family history of severe mental illness, PTSD hyperarousal symptoms, PTSD reexperiencing symptoms, and having education beyond high school.

Model 2, regressing the measure of difficulty managing anger, was statistically significant ( $\chi^2=355.4$ ,  $df=4$ ,  $p<0.001$ ) and explained more than half of the variance (55%). Statistically significant independent variables included parental criminal history, being married, PTSD hyperarousal symptoms, and PTSD avoidance symptoms.

Model 3, regressing the variable denoting problems controlling violent behavior, was statistically significant ( $\chi^2=109.93$ ,  $df=4$ ,  $p<0.001$ ) and accounted for 30% of the variance. Statistically significant independent variables included witnessing family violence, being deployed for more than 1 year, having fired a weapon in a combat situation, and having PTSD hyperarousal symptoms.

To ensure that the link between hyperarousal symptoms and dependent measures was not due only to irritability as a hyperarousal symptom, we conducted post hoc analyses and found that the other four hyperarousal symptoms (sleep problems, difficulty concentrating, vigilance, and jumpiness) each had significant bivariate associations with the three measures of anger and hostility. We also reran multivariate analyses creating a new variable for hyperarousal symptoms that specifically omitted scores for irritability and found that the new variable still had statistically significant associations with all dependent measures. Both sets of findings bolster support for a strong association between anger/hostility and the hyperarousal symptom cluster as a whole.



Table 4 summarizes the characteristics associated the outcome measures.

## Discussion

Little is known about factors associated with risk of post-deployment anger and hostility in Iraq and Afghanistan veterans. This study provides a step toward understanding broad categories of factors that may be implicated. The results indicate that several factors related to anger and hostility in veterans from previous conflicts—witnessing of family violence, history of abuse, and combat exposure (15, 16, 24)—had a modest empirical association in Iraq and Afghanistan veterans with at least some facets of anger and hostility measured. Analyses also indicated that PTSD reexperiencing symptoms and avoidance and numbing symptoms were not consistently associated with anger and hostility but that hyperarousal symptoms were significantly related to all three measures of anger and hostility analyzed. The latter result is consistent with research finding a link between PTSD hyperarousal symptoms and aggression in Vietnam veterans (17, 36). Thus, clinicians treating Iraq and Afghanistan veterans should be aware that hyperarousal symptoms of PTSD may constitute one of the more important clinical symptom clusters to investigate in those with hostility and anger on return to civilian life.

Our data also suggest that the effects of traumatic brain injury and alcohol misuse on anger and hostility are not straightforward; significant bivariate associations between traumatic brain injury and alcohol misuse and the anger and hostility measures were not retained in multivariate analyses. Alcohol misuse has been statistically associated with anger and hostility in veterans from previous conflicts (22). Head injury has been speculated to increase the risk of aggression in Iraq and Afghanistan veterans; in December 2008, the Institute of Medicine released a report requested by the VA documenting long-term health consequences of traumatic brain injury, including violence, in Gulf War veterans (37). However, research has not always confirmed direct effects of these factors in veterans; for instance, studies have shown that alcohol abuse mediates the relationship between PTSD and aggression (20) and PTSD may be related to anger and hostility only when heavy drinking is involved (17). Similarly, brain injury has been found to be related to aggression in veterans when combined with certain cognitive deficits (23). In the present study, PTSD symptoms had considerable overlap with both traumatic brain injury and probable alcohol misuse, raising an interesting question: Might PTSD coupled with traumatic brain injury, or PTSD in conjunction with alcohol abuse, have unique additive effects on aggressiveness or anger and hostility? Future research should examine two-way interactions between combinations of risk factors to determine whether combined factors contribute more than individual factors to post-deployment problems.

Anger management interventions have been developed and implemented for veterans of previous conflicts (36, 38). Our results suggest that clinicians treating Iraq and Afghanistan veterans who present complaining of anger problems should investigate specific types of behaviors and particular sets of risk factors. Clinicians can first ask whether the veteran has had problems controlling violent behavior. If the veteran answers affirmatively, the multivariate model in Table 3 would guide clinicians to investigate aspects of the veteran's background involving violence and aggression, including whether he or she had experienced high levels of violence in the past (e.g., witnessing family violence) and more recently (e.g., firing a weapon in combat, having a longer deployment). If the veteran denies such problems but reports aggressive urges, our analyses suggest that clinicians gather information about psychopathology and trauma, such as a family history of mental illness, a history of abuse, and current PTSD reexperiencing symptoms, potentially from working in a war zone. If the veteran does not report aggressive urges, the data suggest that clinicians should investigate aspects of the anger as related to past and current relationships and

conflict, including whether the veteran had a chaotic upbringing (e.g., a history of parental incarceration), how PTSD avoidance symptoms relate to potential problems in current relationships, and in what ways the veteran might be expressing anger with his or her spouse. Differences between the dependent measures provide empirical support for individually tailoring assessment and interventions addressing symptoms of anger and hostility in Iraq and Afghanistan veterans.

Several study limitations should be noted. The MIRECC registry consists of a self-selected sample of Iraq and Afghanistan veterans from the Mid-Atlantic region of the United States who responded to advertisements and volunteered to participate in research. It is unknown whether the sample is representative of all Iraq and Afghanistan veterans. Research is needed to verify whether the rates of psychiatric disorders and alcohol risk observed in our sample as well as in other recent reports (39, 40) are representative of Iraq and Afghanistan veterans. As such, this study was not designed to provide prevalence estimates of anger and hostility in Iraq and Afghanistan veterans; rather, its purpose was to evaluate potential correlates of anger and hostility in order to suggest promising avenues for mental health assessment and treatment of troops returning from combat. This is an urgent clinical need for which little or no guidance is available from empirical analysis.

Although it could be argued that, *prima facie*, the three dependent variables in this study seem too closely related, correlations revealed considerable non-collinearity, and multivariate analyses confirmed substantially different statistical models of each, strongly supporting the thesis that they are separate, distinct constructs. Other study limitations include the cross sectional structure of the analysis, precluding causal ordering of risk factors and restricting inference to the level of association. Self-report measures may underestimate actual problems with aggressiveness and alcohol use. Also, while this study measured anger, aggressiveness, and perceived problems controlling violence, it did not include a measure of violent acts; hence, it is unknown whether the risk factors we identified are associated with actual violence. Finally, additional investigation is needed of other risk and protective factors, including personality disorders, drug abuse, use of health services (e.g., involvement in rehabilitation, adherence to medications), and situational factors (e.g., social support, coping skills, details of work, and financial stability).

When veterans become angry, aggressive, or violent, the cost to individuals, their families, their communities, and society is high. There are nearly 1 million veterans from this era who have already been discharged, and tens of thousands more troops will return from combat in Iraq and Afghanistan in the next few years. Given data revealing post-deployment mental health problems, we urgently need theoretically sophisticated, evidence-based knowledge to identify those most prone to anger and hostility and to evaluate how the risk can be effectively managed. This study takes a step toward this goal by identifying variables that could ultimately be used among evidence-based approaches for mental health providers and military staff helping to alleviate and prevent post-deployment adjustment problems.

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Difficulty Managing Anger	Aggressive Impulses/Urges	Problems Controlling Violence
1. PTSD Hyperarousal Symptoms	1. PTSD Hyperarousal Symptoms	1. PTSD Hyperarousal Symptoms
2. Parental Criminal History	2. PTSD Re-experiencing Symptoms	2. Witnessed Family Violence
3. PTSD Avoidance Symptoms	3. Family Mental Illness	3. Iraq/Afghanistan More than One year
4. Currently Married	4. Education Level	4. Fired a Weapon during Combat
	5. Physical/sexual Abuse Prior to Age 18	
	6. Served in Warzone	

**Figure 1.**  
 Characteristics associated with anger and hostility among Iraq/Afghanistan veterans, listed  
 in order of statistical significance

**Table 1**

Characteristics of Iraq/Afghanistan Veteran Sample (N=676)

	% or median	N
<i>Demographic Data</i>		
Age	36	
Post High School	53.55%	362
Female	19.53%	132
White	43.79%	296
Married	54.59%	369
Currently Working	70.12%	474
<i>Historical Factors</i>		
Parental Criminal History	7.69%	52
Physical/sexual Abuse before age 18	33.58%	227
Witnessed Family Violence	40.09%	271
Family Severe Mental Illness	25.74%	174
History of Incarceration	19.23%	130
<i>Military Variables</i>		
Served in OIF/OEF Warzone	80.92%	547
Fired Weapon	38.31%	259
Officer	9.32%	63
Redeployed	26.63%	180
Over a Year in Iraq/Afghanistan	26.92%	182
Reserves or National Guard	43.20%	292
<i>Clinical Factors</i>		
Traumatic Brain Injury During Deployment	21.75%	147
PTSD (above scale cut-off)	45.85%	310
High risk of Alcohol Misuse (above scale cut-off)	23.22%	157
Loss of Consciousness During Deployment	9.62%	65

**Table 2**  
 Bivariate Associations between Risk/Protective Factors and Anger/Hostility (N=676)

	Aggressive Impulses		Difficulties with Anger		Problems Controlling Violence	
	r	p	r	p	r	p
<i>Demographic Data</i>						
Age	-0.10	0.008***	-0.05	ns	-0.05	ns
Post High School	-0.14	<.001***	-0.12	0.001***	-0.09	.02**
Female	-0.05	ns	-0.05	ns	0.01	ns
White	0.06	ns	0.03	ns	0.01	ns
Married	-0.01	ns	0.07	ns	-0.01	ns
Currently Working	-0.11	0.001***	-0.17	<.0001***	-0.07	.05*
<i>Historical Factors</i>						
Parental Criminal History	0.07	ns	0.12	0.001***	0.05	ns
Physical/sexual Abuse before 18	0.14	<.001***	0.12	.002***	0.07	.05*
Witness Family Violence	0.09	0.02**	0.08	0.03**	0.11	.004**
Family Mental Illness	0.17	<.0001***	0.14	<.001***	0.08	.04**
History of Incarceration	0.11	0.003**	0.11	.006**	0.03	ns
<i>Military Variables</i>						
Served in Warzone	0.22	<.0001***	0.19	<.0001***	0.08	.04*
Fire Weapon	0.24	<.0001***	0.23	<.0001***	0.21	<.0001***
Rank (Officer or Higher)	-0.08	0.03*	-0.09	.02*	-0.10	.01*



	Aggressive Impulses		Difficulties with Anger		Problems Controlling Violence	
	r	p	r	p	r	p
Redeployed	0.02	ns	0.06	ns	0.03	ns
Iraq/Afghanistan >1 year	0.12	0.001**	0.12	.004**	0.16	<.0001***
Combat Exposure Scale	0.33	<.0001***	0.30	<.0001***	0.19	<.0001***
Reserves or Nat'l Guard	-0.01	ns	0.02	ns	0.02	ns
<i>Clinical Factors</i>						
Traumatic Brain Injury	0.19	<.0001***	0.17	<.0001***	0.11	.005**
PTSD (above scale cut-off)	0.49	<.0001***	0.56	<.0001***	0.30	<.0001***
Alcohol Misuse	0.23	<.0001***	0.22	<.0001***	0.15	<.001***
Loss of Consciousness	0.16	<.0001***	0.18	<.0001***	0.09	.02*

ns=not significant;

\*  $p < .05$ ;

\*\*  $p < .01$ ;

\*\*\*  $p < .001$



	Aggressive Impulses/Urges			Difficulty Managing Anger			Problems Controlling Violence		
	Odds Ratio	Confidence Interval	p-value	Odds Ratio	Confidence Interval	p-value	Odds Ratio	Confidence Interval	p-value
Iraq/Afghanistan >1 year			ns			ns	2.04	1.18–3.52	.01
Combat Exposure Scale			ns			ns			ns
Reserves or Nat'l Guard			ns			ns			ns
<i>Clinical Factors</i>									
Traumatic Brain Injury			ns			ns			ns
PTSD B (Re-experiencing)	1.04	1.01–1.07	.006			ns			ns
PTSD C (Avoidance)			ns	1.03	1.01–1.05	.01			ns
PTSD D (Hyperarousal)	1.09	1.06–1.12	<.001	1.12	1.08–1.15	<.001	1.10	1.07–1.13	<.001
Alcohol Misuse			ns			ns			ns
Loss of Consciousness	$R^2=.48$		ns	$R^2=.55$		ns	$R^2=.30$		ns
	$\chi^2=279.11, df=6, p<.001$			$\chi^2=355.4, df=4, p<.001$			$\chi^2=109.93, df=4, p<.001$		