



Reintegrating subjective and objective aspects of war-related PTSD

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Abstract

Studies of PTSD in military populations have repeatedly demonstrated a dose-response relationship between combat exposures and PTSD symptoms. While this relationship is compelling, the strong focus on objective events (combat exposures) has lead to a diminished emphasis on subjective reactions such as horror and helplessness. In this manuscript we (1) replicate the dose-response relationship in a sample of Navy personnel deployed to Operation Iraqi Freedom or Operation Enduring Freedom, and (2) demonstrate that subjective reactions to events account for more of the variance in PTSD than is explained by objectively reported combat exposures. We conclude that service members must be prepared not just for general aspects of combat stress, but also for feelings of intense fear, helplessness, or horror.

Reintegrating subjective and objective aspects of war-related PTSD

The 1980 revision of the American Psychiatric Association *Diagnostic and Statistical Manual* (DSM) introduced the diagnosis of posttraumatic stress disorder (PTSD) (American Psychiatric Association, 1980). The PTSD diagnosis was created to provide Department of Veterans Affairs and military psychiatrists with a classification that seemed to better fit the symptoms observed after combat-related trauma in Vietnam veterans than previously used terms for these symptoms, including “shell shock”.

Although the diagnostic criteria for PTSD have been revised in subsequent versions of the DSM, the essential elements for a PTSD diagnosis are; 1) that an individual has experienced a “traumatic event” involving actual or threatened death or injury, and 2) the experience includes a subjective response marked by intense fear, helplessness, or horror. (The “event component” of PTSD case definition is typically referred to as PTSD Criterion A1, and the subjective component of PTSD case definition is often referred to as PTSD Criterion A2). Subsequently, the individual must experience, at least one month after the traumatic event and lasting for at least 1 month, symptoms from each of three symptom clusters: intrusive recollections, avoidant/numbing symptoms, and hyperarousal symptoms. Finally, the individual must experience significant social, occupational, or other distress as a result of these symptoms.

Since the establishment of the PTSD diagnosis, PTSD epidemiology and prevalence have been extensively researched, and the basic premises of the DSM definition have been challenged on a number of fronts. In particular, some discussions of PTSD no longer emphasize subjective

responses of intense fear, helplessness, or horror. In part, the shift in focus away from intense fear responses solves an inherent inconsistency, because many trauma victims respond with emotional numbing rather than terror (Bryant & Harvey, 1997). In addition, some studies now indicate that “low magnitude” stressors without significant emotional impact can play a role in the spectrum of stress disorders that includes PTSD (Moreau & Zisook, 2002).

For example, Litz, Orsillo, et al. (1997) examined the prevalence of PTSD among peacekeepers in Somalia approximately 5 months after their return to the United States. Litz et al. found that 8% of peacekeepers met the diagnostic criteria for PTSD, and that PTSD symptom severity was best predicted by the rewards of military service, war-zone stress, and frustrations with peacekeeping (e.g., restrictive rules of engagement). Thus, PTSD was associated with chronic moderate stress and frustration. Similarly, Spitzer et al. (2000) studied PTSD in civilian psychiatric patients and found that the majority of patients who met the diagnostic criteria for PTSD had experienced minor traumas rather than major traumas. Spitzer et al. (2000) also concluded that low-magnitude stressors can lead to PTSD.

Moreover, after examining the literature, Marshall, Davis, and Sherbourne (2000) stated that:

The impact of war-zone exposure to low-intensity events has only recently been subjected to systematic empirical research (e.g., King, King, Gudanowski, 1995; Litz, King, et al., 1997), and much remains to be learned about the nature and circumstances in which these exposures lead to stress-related health consequences. Nonetheless, available data indicate that these seemingly ordinary

experiences may be more potent stressors than previously believed. In particular, exposure to low-level daily hassles appears to predict adjustment outcomes independently of exposure to high-magnitude stressors.

These examples illustrate a shift away from PTSD as a response to a “horrific event,” and toward a stress continuum model that emphasizes the impact of cumulative threats, frustrations, and misery. This shift is further encouraged by published findings of a dose-response relationship between combat exposures and clinically diagnosed PTSD (Dohrenwend, Turner, Turse, Adams, Koenen, & Marshall, 2006) as well as a dose-response relationship between combat exposures and PTSD symptoms (Hoge et al., 2004). In fact, the dose-response conceptualization of PTSD is increasingly becoming the default model for characterizing the phenomenology of PTSD in military populations (Castro & McGurk, 2007).

The primary objective of our study was to contrast the relative influence of self-reported objective and subjective experiences on severity of PTSD symptoms. As a first step, we sought to replicate, in a sample of Navy personnel deployed to ground-based assignments in Operation Iraqi Freedom and Operation Enduring Freedom, the dose-response relationship between cumulative combat exposures and PTSD symptoms. Second, we examined the additional explanatory value of incorporating intensely negative subjective reactions. The purpose of the second analysis was to determine whether the emerging default model of PTSD risk, which relies on objective exposure to cumulative stressors, is undermined by the failure to also integrate intense emotional reactions to events (per the DSM characterization of PTSD).

Method

Participants

Study participants were 1,444 Navy personnel who were assigned to land combat or land combat support assignments in either Iraq or Afghanistan and who completed a survey, between December 2006 and February 2008. We administered 1,187 surveys to personnel in Iraq, 124 in Kuwait, and 133 at Fort Bragg (immediately following a return from Iraq or Afghanistan). The vast majority of our sample was male (86.2%). Approximately 26% of subjects were aged 24 years or younger, 50% were between the ages of 25 and 39, and 24% were 40 or older. 68.6% were White, 11.4% Hispanic, 8.2% Black, and 11.7% were other/mixed race.

Procedures

The participants gave written informed consent prior to participation and were informed that participation was voluntary. The study was designated as exempt research by the Institutional Review Board of the Naval Health Research Center. Surveys were group-administered by various researchers and medical department staff at the different sites. To help ensure privacy, all surveys were anonymous and were distributed in unmarked envelopes and returned in those same envelopes. Participants were informed that they could skip questions or completely cease participation at any time.

Measures

Combat exposure was assessed using the U.S. Army Mental Health Advisory Team (MHAT) combat exposure scale, which includes 33 items assessing experiences such as “knowing someone seriously injured or killed” and “being wounded/injured.” Possible responses to the combat exposure items were reported on a Likert-type scale ranging from 1 (never) to 5 (10 or more times). An overall combat exposure score (ranging from 33 to 165) was created by summing the number of reported experiences. We created four subgroups (low, medium, high, and very high) for combat exposure analysis by forming quartiles based on self-reported level of combat exposure.

We used the standardized Posttraumatic Stress Disorder Checklist–Civilian Version (PCL-C), which is a 17-item self-report measure of PTSD symptoms that requires participants to rate the severity of each symptom during the previous 30 days on a Likert-type scale ranging from 1 (not at all) to 5 (extremely). A cutoff score of 50 (on a scale from 17 to 85 points for all of the questions on the checklist) has been proposed for military samples to achieve maximum sensitivity and specificity, which are reportedly .82 and .84, respectively (Weathers, Litz, Herman, Huska, & Keane et al., 1993), although Blanchard et al. (1996) found that the same cutoff yielded a sensitivity of .78 and a specificity of .86. Weathers et al. also reported that PCL scores are significantly correlated with measures of combat exposures ($r = .46$; Weathers et al., 1993). We created two “PTSD symptom severity” subgroups based on whether the participants scored ≥ 50 or < 50 , respectively.

The internal consistency of the PCL in our sample, as measured by Cronbach's alpha ($\alpha = 0.95$), indicated that these data were internally reliable for this cohort. In our various PCL analyses, we used both continuous PCL scores with a possible range of 17 to 85 and the two discrete subgroups based on a PCL cutoff of 50, as appropriate for answering particular questions.

To assess if a subject had an intense negative emotional response, the survey included the following yes/no question: "Did any experience on this deployment cause you intense fear, helplessness, or horror?" Respondents who answered "yes" were encouraged to write a brief description of the event in a space left blank on the survey page for this purpose. The question itself reflects the presence/absence of Criterion A2 in the diagnosis of PTSD.

Analyses

We completed descriptive analyses of population characteristics and self-reported PTSD symptoms, combat exposures, and intense negative emotional response. We ran a bivariate correlation analysis to determine the linear relationship between total combat exposures and PTSD symptoms as reported on the PCL. Chi-square analysis was used to examine demographic differences between subjects who reported an intense negative emotional response to an event and those who did not. Subsequently, logistic regression analysis was used to determine associations between PCL status, combat exposure level, and intense negative emotional response to an event, respectively.

A two-way factorial analysis of variance (ANOVA) was used to assess main effects and possible interactions among combat exposure, intense negative emotional response, and PCL score. An alpha level of 0.05 was used for all analyses of group differences. We used SPSS software, version 16.0 (SPSS Inc., Chicago, IL), for data management and statistical analyses.

Results

The mean PCL score was 27.27 ($SD = 12.30$), and 7.2% of the sample had a score of ≥ 50 .

Almost 26% of subjects ($n = 370$) reported an intense negative emotional response (Criterion A2) during their current or most recent deployment.

Table 1 shows the 33 items in the combat exposure scale, the number of personnel endorsing each item, and the correlation of the item with PCL score. The four most commonly reported combat experiences were receiving incoming artillery, rocket, or mortar fire (70.1%), knowing someone seriously injured or killed (44.8%), seeing dead bodies or human remains (43.8%), and seeing dead or seriously injured Americans (38.3%). While all combat experiences were significantly correlated with PCL ($p < .01$), the four experiences with the highest correlations were “being attacked or ambushed” (.24), “had a buddy shot or hit who was near you” (.23), “having hostile reactions from civilians” (.22), and “being wounded/injured” (.21). The linear correlation between the continuous score on the PCL and the continuous score on the combat exposure scale was .38 ($p < .001$).

While the correlational analyses relied on continuous PCL scores with a possible range of 17-85, subsequent analyses used PTSD subgroups based on the widely used cutoff score of $PCL \geq 50$. The univariate odds ratio (shown in Table 2) that was calculated for combat exposures indicated that members of the very high combat exposure quartile were 7.09 times more likely to score ≥ 50 on the PCL compared with members of the low combat exposure quartile (95% confidence interval [CI], 3.54-14.22; $p < .001$).

The univariate odds ratio for subjective trauma response indicated that individuals who endorsed having a reaction of “intense fear, helplessness, or horror” were 9.41 times more likely to score ≥ 50 on the PCL than were individuals who did not endorse this item (95% CI, 6.40-13.84; $p < .001$).

When all of the measures were analyzed in combination with one another, the adjusted odds ratios (Table 2) showed members of the very high combat exposure quartile were 3.45 times more likely to score ≥ 50 on the PCL when compared with members of the low combat exposure quartile (95% CI, 1.60-7.41; $p < .01$). In addition, subjects reporting an intense negative emotional response were 7.13 times more likely to score ≥ 50 on the PCL than were individuals who did not endorse this item, after controlling for combat exposure (95%CI, 4.44-11.44; $p < .001$).

The mean PCL scores for the Criterion A2 subgroups are shown in Figure 1. The upper line displays, as a function of combat exposure quartile, the mean PCL scores for subjects who endorsed Criterion A2. The bottom line displays the same information for subjects who did not

endorse Criterion A2. Of particular note, individuals with a *low level of combat exposure* but with a subjective experience of intense fear, helplessness, or horror had somewhat *higher levels of PTSD symptoms* than individuals with a *very high level of combat exposure* but without Criterion A2 (mean PCL = 29.23 vs. 26.73, *ns*). Individuals who endorsed Criterion A2 had higher mean PCL scores at all levels of combat exposure compared with individuals who did not endorse A2.

The factorial ANOVA detected the main effects of exposure level, $F(3,1436) = 18.806, p \leq 0.001$ and criterion A2, $F(1,1436) = 181.55, p \leq 0.001$. The interaction effect was nonsignificant, $F(3,1436) = 2.46, p > .05$. The ANOVA results confirm that both objective combat level and subjective emotional response are significantly associated with reported levels of PTSD symptoms.

Table 3 and Figure 2 display combat exposure and PCL means for the various subgroups. In Figure 2, which shows the average PCL score for each of the combat exposure quartiles, the black part of each bar represents the proportion of individuals in each exposure quartile who reported Criterion A2. From the lowest to the highest quartile, respectively, the proportion of individuals who reported Criterion A2 was .08%, 19%, 32%, and 54%.

Discussion

Although the DSM diagnostic criteria for PTSD include a *subjective* reaction of intense fear, helplessness, or horror, many studies of PTSD risk either rely on the *objective* dose of stressors

(e.g., Castro & McGurk, 2007; Dohrenwend et al., 2006; Institute of Medicine, 2007) or emphasize other subjective aspects of trauma response such as emotional numbing (Roemer, Orsillo, Borkovec, & Litz, 1998).

The current study adds to a body of findings indicating that an intense negative emotional response to a traumatic experience is strongly tied to the onset of PTSD (Rosen & Lilienfeld, 2008). For example, Iversen et al. (2008) recently completed an analysis of risk factors for PTSD among U.K. military personnel who have been deployed to Iraq since 2003. After examining a number of variables related to demographics, childhood adversity, and war-zone experiences, they concluded that the most important predictor of PTSD symptoms was personal appraisal of threat to life during a combat experience. Holbrook, Hoyt, Stein, and Sieber (2001) enrolled 1,048 trauma patients into a survey study examining predictors of PTSD. PTSD was subsequently diagnosed in 32% of the patients, and the single best predictor was endorsement of the question “did you feel during this event that your life was in danger?”

Creamer, McFarlane, and Burgess (2005) examined a community sample of 6,104 adult trauma victims and found that only 3% of those who did *not* report intense fear, helplessness, or horror (Criterion A2) went on to suffer persistent traumatic memories. Similarly, a study of a community sample of trauma victims in Michigan also found that PTSD rarely resulted from events that did not involve intense fear, helplessness, or horror (Breslau & Kessler, 2001). Also, Brewin, Andrews, and Rose (2000) reported that intense levels of all three emotions strongly predicted later PTSD in victims of violent crime.

In reporting these results, we seek to highlight the subjective aspects of trauma because we sense a process of intellectual drift regarding PTSD risk, particularly PTSD risk in service members exposed to combat. The emphasis on objective exposures (i.e., combat dose) should be counterbalanced by reintegrating what many studies have demonstrated, specifically, that subjective response is paramount. The present analysis supports such a reintegration, by redemonstrating the contribution of both objective and subjective factors to the severity of PTSD symptoms.

Several other aspects of our data merit discussion. The PTSD rate found in our sample is consistent with other recent studies of combat deployed personnel (e.g., Smith, Ryan, Wingard, Slymen, Sallis, and Kritz-Silverstein, 2008). In addition, while almost 26% of subjects reported feeling intense horror, fear, or helplessness during their deployment, only 7.2% of the sample had a PCL score of ≥ 50 . Therefore, the majority of individuals who have an emotional response consistent with PTSD Criterion A2 do not report clinically meaningful levels of PTSD symptoms. A variety of factors are undoubtedly at play in determining the pathway between Criterion A2 and PTSD, and further examination of this issue is clearly warranted. The percentage of individuals endorsing Criterion A2 increased as a function of higher combat exposure level. It is therefore possible that greater combat exposure *predisposes* individuals to intense negative emotions. Alternatively, it may be the case that as the sheer amount of exposure increases, so do the “odds” of a specific event that elicits intense negative emotions. Further study of this issue is also clearly needed.

In summary, service members must be prepared not just for general aspects of combat stress, but also for horrific moments involving overwhelming mental anguish. To our knowledge, combat stress programs rarely place direct emphasis on the latter. Development of training strategies to better prepare service members for incidents of acute traumatic stress, such as techniques to control emotional arousal in the aftermath of perceived trauma, should be a specific priority for military researchers.

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Table 1.

Frequency of combat exposures and Pearson correlation of each exposure with PCL-C Score

Combat exposure	Correlation		
	N	(%)	with PCL
1. Being attacked or ambushed	473	(32.8)	.24
2. Seeing destroyed homes and villages	535	(37.0)	.13
3. Receiving small arms fire	392	(27.1)	.15
4. Seeing dead bodies or human remains	632	(43.8)	.16
5. Handling or uncovering human remains	258	(17.9)	.10
6. Witnessing an accident that resulted in serious injury or death	300	(20.8)	.17
7. Witnessing violence within the local population or between ethnic groups	272	(18.8)	.20
8. Seeing dead or seriously injured Americans	553	(38.3)	.14
9. Knowing someone seriously injured or killed	647	(44.8)	.17
10. Participating in demining operations	128	(8.9)	.17
11. Improvised explosive device (IED) or booby trap exploded near you	260	(18.0)	.18
12. Working in areas that were mined or had IEDs	421	(29.2)	.14
13. Having hostile reactions from civilians	239	(16.6)	.22
14. Disarming civilians	80	(5.5)	.13

15. Being in threatening situations where you were unable to respond because of rules of engagement	239	(16.6)	.28
16. Shooting or directing fire at the enemy	142	(9.8)	.14
17. Calling in fire on the enemy	55	(3.8)	.13
18. Engaging in hand-to-hand combat	17	(1.2)	.09
19. Clearing/searching homes or buildings	138	(9.6)	.10
20. Clearing/searching caves or bunkers	54	(3.7)	.14
21. Witnessing brutality or mistreatment toward noncombatants	67	(4.6)	.18
22. Being wounded/injured	77	(5.3)	.21
23. Seeing ill/injured women or children whom you were unable to help	178	(12.3)	.15
24. Receiving incoming artillery, rocket, or mortar fire	1012	(70.1)	.14
25. Being directly responsible for the death of an enemy combatant	16	(1.1)	.14
26. Observing abuse of Laws of War/Geneva Convention	33	(2.3)	.19
27. Feeling responsible for the death of U.S. or ally personnel	41	(2.8)	.14
28. Having a member of your own unit become a casualty	392	(27.1)	.15
29. Had a close call, like having a dud land near you	196	(13.6)	.17
30. Had a close call, like having equipment shot off your body	12	(0.8)	.19
31. Had a close call, like being shot or hit but protective	40	(2.8)	.18

gear saved you			
32. Had a buddy shot or hit who was near you	64	(4.4)	.22
33. Informed unit members or friends of a unit member's	127	(8.8)	.11
death			

Note. PCL-C = Posttraumatic Stress Disorder Checklist – Civilian Version

* $p < .01$.

Table 2.

Logistic regression results using combat exposure level and intense emotional response to predict PCL-C group

		<u>Univariate</u>		<u>Adjusted</u>	
	N (%)	OR	95% CI	OR	95% CI
Exposure level					
Low	442 (30.7)	1.00		1.00	
Medium	300 (20.8)	1.96	0.85-4.56	1.60	0.66-3.87
High	355 (24.6)	4.44	2.16-9.13	2.74	1.26-5.98
Very high	346 (24.0)	7.09	3.54-14.22	3.45	1.60-7.41
Intense emotion					
No	1074 (74.4)	1.00		1.00	
Yes	370 (25.6)	9.41	6.40-13.84	7.13	4.44-11.44

Note. PCL-C = Posttraumatic Stress Disorder Checklist – Civilian Version; PCL groups are total score of <50 or ≥ 50); OR = odds ratio; CI = confidence interval.

Table 3.

PCL-C values by combat exposure level and endorsement of Criterion A2

		Criterion A2		Overall
		endorsed	not endorsed	
Combat exposure	<i>N</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Low	442	29.23 (12.2)	21.97 (7.9)	22.61 (8.6)
Medium	300	33.33 (14.4)	23.42 (8.2)	25.31 (10.4)
High	355	36.75(16.8)	25.86 (9.7)	29.36 (13.4)
Very high	346	39.81(16.3)	26.73 (11.5)	32.78 (15.4)
Overall	144	36.76 (16.1)	24.00 (9.3)	27.27 (12.7)

Note: Higher values indicate greater severity of PTSD symptoms; Criterion A2 refers to a subjective response of intense fear, helplessness, or horror.

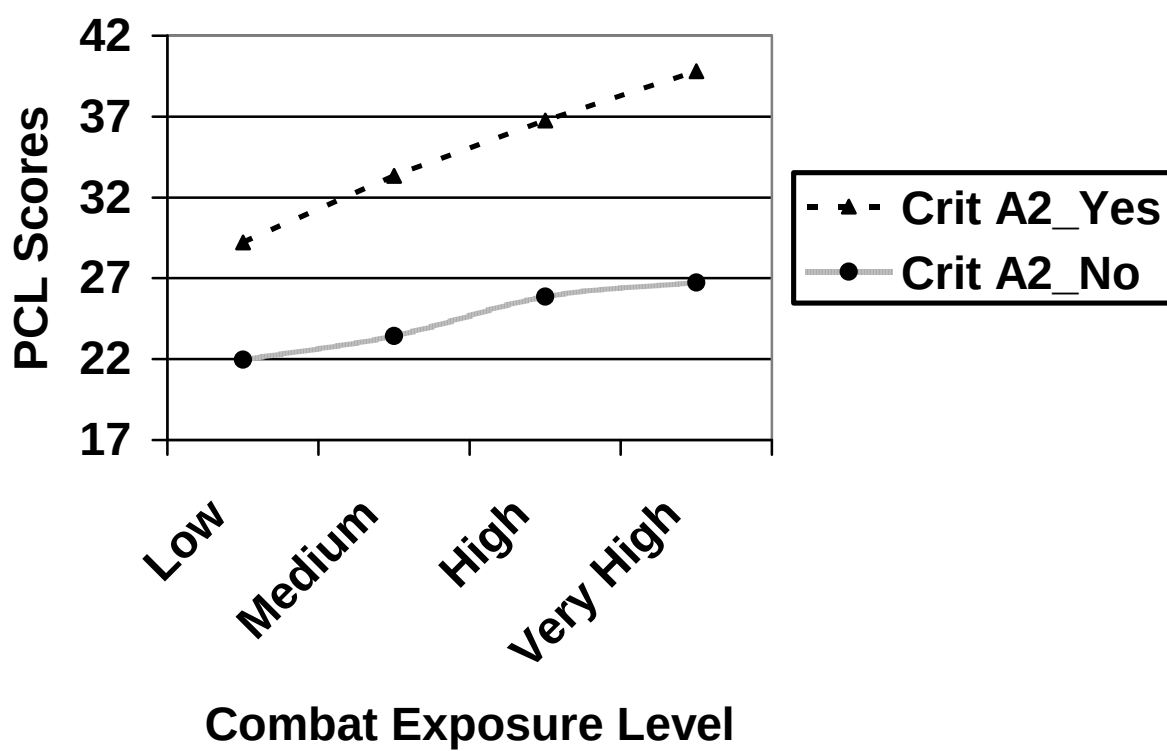


Fig. 1. PCL = Posttraumatic Stress Disorder Checklist (Civilian Version). Mean PCL score stratified by combat exposure quartiles and endorsement of Criterion A2.

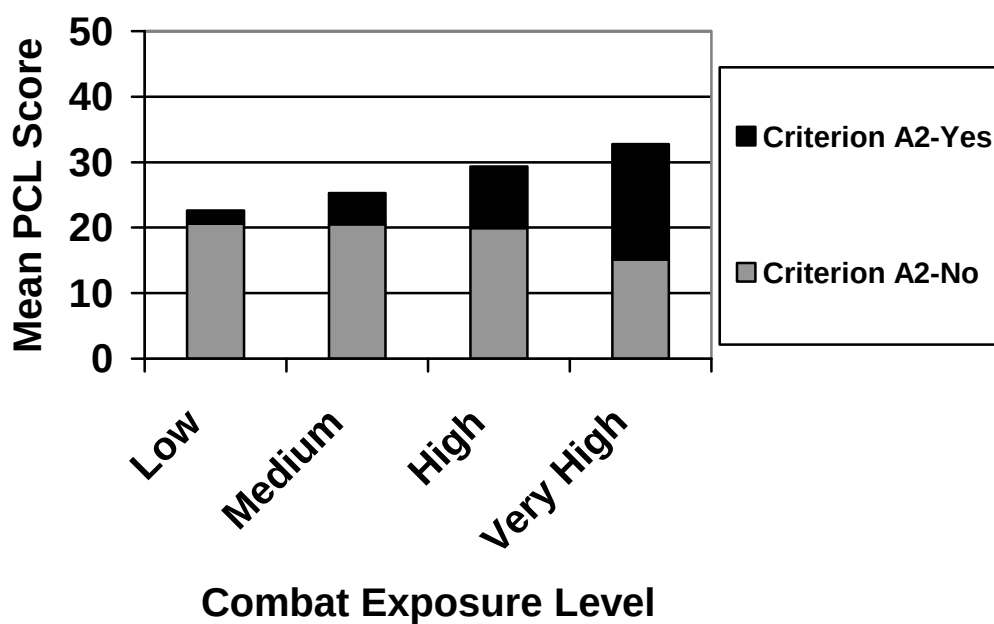


Fig. 2. PCL = Posttraumatic Stress Disorder Checklist (Civilian Version). Mean PCL score at each combat exposure level and proportion of subjects in each level who reported Criterion A2

REPORT DOCUMENTATION PAGE

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