



## Effects of combat deployment on risky and self-destructive behavior among active duty military personnel

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### ABSTRACT

Although research has documented negative effects of combat deployment on mental health, few studies have examined whether deployment increases risky or self-destructive behavior. The present study addressed this issue. In addition, we examined whether deployment effects on risky behavior varied depending on history of pre-deployment risky behavior, and assessed whether psychiatric conditions mediated effects of deployment on risky behavior. In an anonymous survey, active duty members of the U.S. Marine Corps and U.S. Navy ( $N = 2116$ ) described their deployment experiences and their participation in risky recreational activities, unprotected sex, illegal drug use, self-injurious behavior, and suicide attempts during three time frames (civilian, military pre-deployment, and military post-deployment). Respondents also reported whether they had problems with depression, anxiety, or PTSD during the same three time frames. Results revealed that risky behavior was much more common in civilian than in military life, with personnel who had not deployed, compared to those who had deployed, reporting more risky behavior and more psychiatric problems as civilians. For the current time period, in contrast, personnel who had deployed (versus never deployed) were significantly more likely to report both risky behavior and psychiatric problems. Importantly, deployment was associated with increases in risky behavior only for personnel with a pre-deployment history of engaging in risky behavior. Although psychiatric conditions were associated with higher levels of risky behavior, psychiatric problems did not mediate associations between deployment and risky behavior. Implications for understanding effects of combat deployment on active duty personnel and directions for future research are discussed.

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### 1. Introduction

High levels of continuing U.S. military deployments in support of war efforts in Iraq and Afghanistan have heightened concerns about effects of combat on military personnel. Research has documented increases in psychological problems among personnel returning from combat deployment. Although most studies have focused on post-traumatic stress disorder (PTSD), increases in related problems such as depression and substance abuse also have been demonstrated (Boscarino, 1995; Hoge et al., 2004). Comparatively less attention has been paid to potential effects of deployment on other psychological and behavioral health issues. The present study investigated the effects of combat deployment on

a constellation of behaviors that are either overtly self-destructive or that place the individual at substantial risk of harm.

“Risky or self-destructive” behavior is a broad category. At one end of the spectrum are activities that could result in harm to the self but are not necessarily intended to do so, such as risky recreation (e.g., extreme sports), risky driving (e.g., driving without a seatbelt or after drinking), risky sexual activities (e.g., sex with strangers, unprotected sex), and substance use or abuse; at the other end of the continuum are behaviors explicitly intended to harm the self, including deliberate self-harm without suicidal intent (“self-harm”), suicide attempts, and suicide. Although these behaviors may be subsumed under the rubric of “self-injurious thoughts and behaviors” (Silverman et al., 2007), they do not constitute a homogenous set; the behaviors likely differ in several respects, including their prevalence, motivational underpinnings, the potential severity of adverse consequences, and the nature and magnitude of barriers to performing them. Nonetheless, different

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types of risky behaviors tend to co-occur. For example, individuals who engage in self-harm are more likely than those who do not to attempt suicide (e.g., Muehlenkamp and Gutierrez, 2007), use illicit drugs (e.g., Matsumoto et al., 2005), and be involved in other risky behaviors (e.g., Laye-Gindhu and Schonert-Reichl, 2005). Similarly, both heavy drinking and heavy smoking are associated with risky sexual behavior (e.g., Leigh et al., 1994) and risky driving (e.g., Fear et al., 2008). Moreover, different types of risky behavior often share common predictors. For example, most types of risky behavior are more common among young men than among women or older men (Nell, 2002; Zuckerman, 2007).

The present study examined effects of combat deployment on five specific types of risky or self-destructive behavior: dangerous recreational activities, unprotected sex with someone other than a regular partner, illegal drug use, self-harm, and suicide attempts. Our primary hypothesis was that rates of each risky behavior would be higher following combat deployment than before deployment. Of the five types of risky or self-destructive behavior considered in the present study, only substance use and suicide-related thoughts and behaviors have received significant research attention as possible consequences of military deployment. Combat deployment has been associated with increased likelihood of drug and alcohol problems (Browne et al., 2008; Calhoun et al., 2008; Hoge et al., 2004; Koenen et al., 2003). However, empirical findings regarding the association between deployment and suicide-related ideations and behaviors have been weak and inconsistent (Centers for Disease Control, 1987; Hall, 1996; Hansen-Schwartz et al., 2002; Kaplan et al., 2009; O'Toole and Cantor, 1995; Thoresen et al., 2003; Wojcik et al., 2009; Wong et al., 2001).

Although we are aware of no previous research examining the impact of deployment on risky recreational activity, unprotected sex, or self-harm, combat deployment has been linked with increases in risky driving behaviors (e.g., speeding, failing to wear one's seat belt; Fear et al., 2008). In addition, in a sample of Army soldiers returning from Iraq, specific combat experiences were related to scores on a scale assessing general preferences for engaging in risky activities (e.g., seeking the "thrill of danger," liking to drive fast; Killgore et al., 2008). However, because risk-taking preferences prior to deployment were not assessed in this study, it is not possible to determine whether combat exposure changed risk preferences, or whether those who preferred risky situations sought out combat exposure; indeed, some evidence suggests that military personnel with higher risk-taking proclivities may be more likely to deploy and to volunteer for hazardous duties (Bell et al., 2010; Bricknell et al., 1999; Jobe et al., 1983; Zuckerman, 2007).

There are several mechanisms by which combat deployment might increase risky behavior. Joiner's (2005) interpersonal-psychological theory of suicidal behavior posits that repeated exposure to pain or fear-inducing situations (e.g., through combat exposure) results in habituation, i.e., greater tolerance for pain and lower levels of fear. In turn, this habituation increases the individual's capability to enact lethal self-injury. Using similar logic, Killgore et al. (2008) suggested that habituation to danger as a result of long-term combat exposure may increase risk-taking propensities among veterans. In support of these formulations, recent evidence indicates that combat exposure is associated with self-reported habituation to pain and decreases in fear (Brenner et al., 2008; Bryan et al., 2010). A related possibility is that returning combat veterans may engage in risky behavior in an attempt to create an "adrenaline rush" similar to those that they experienced in combat (Vaughan, 2006).

Increases in risky behaviors following deployment also may result from deployment-related increases in psychiatric symptoms such as depression and PTSD (e.g., Hoge et al., 2004). Although negative emotional states have been linked with both suicidality

and self-harm (e.g., Whitlock and Knox, 2007), links with less overtly self-destructive behaviors such as risky recreation, unprotected sex, and illegal drug use are less clear. Nonetheless, risky behaviors that are not intrinsically self-destructive sometimes may be undertaken, either consciously or subconsciously, with self-destructive intent. Consistent with this view, accidental deaths and suicides have been found to have common risk factors (Stea et al., 2002; Thoresen and Mehlum, 2004). Previous findings of elevated rates of accidental death among combat veterans (Catlin Boehmer et al., 2004; Kang et al., 2002; Knapik et al., 2009) may thus reflect some instances in which individuals purposefully engaged in risky behaviors for self-destructive purposes. In the present study, we examined whether psychiatric conditions (depression, anxiety, and PTSD) were associated with risky behavior. In addition, we examined whether these conditions mediate the impact of deployment on risky behaviors.

In addition to predicting that combat deployment would increase rates of risky behavior in general, we expected deployment effects to differ depending on the individual's prior history of risky behavior. Specifically, effects of deployment in increasing risky behavior were expected to be most pronounced among those who had engaged in the behavior previously. Prior engagement in risky behavior may be a marker for psychological difficulties or vulnerabilities that place the individual at risk of developing adverse reactions to deployment. At a minimum, prior engagement in a behavior indicates that it is part of the individual's behavioral repertoire. If the individual has engaged in a behavior in the past, perhaps as a means of coping with distress (e.g., Klonsky, 2007), he or she may turn to the same strategy again to cope with the stresses associated with deployment or with readjustment following deployment. We could locate no prior research investigating whether deployment effects are moderated by prior behaviors.

In the present study, we first used within-subjects analyses to examine changes in risky behavior from civilian to military life (for both combat deployed and non-deployed personnel) and from pre-deployment to post-deployment life (for combat deployed personnel only). Next, we directly compared rates of risky behavior among active duty personnel who had previously combat deployed and those who had not. In addition, we examined whether effects of combat deployment on risky behavior differed depending on whether the individual had engaged in that behavior in the past. We predicted that effects of deployment on a given risky behavior would be stronger among individuals who had a history of engaging in that type of behavior. Each analysis was conducted across five different types of risky behavior (risky recreational activities, unprotected sex, illegal drug use, self-harm, and suicide attempts), allowing for a determination of whether combat deployment had similar or distinct effects on different types of behavior. A final set of analyses examined patterns of psychiatric problems (depression, anxiety, and PTSD) before and after deployment and among deployers and non-deployers, and tested whether deployment-related increases in psychiatric problems might account for any effects of deployment on risky or self-destructive behaviors.

## 2. Methods

### 2.1. Participants

The Naval Health Research Center (NHRC) Combat Stress and Substance Use survey was conducted between August 2006 and August 2007. Participants were active duty military personnel serving at U.S. Marine Corps (USMC) installations in Southern California and Arizona within three major commands: Marine Corps Air Station Yuma Arizona (primarily 3rd Marine Air Wing);

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