



Thought suppression failures in combat PTSD: A cognitive load hypothesis[☆]

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ABSTRACT

The present study investigated the relation between thought suppression of emotionally neutral content [i.e., Wegner's (1994) "white bear"], incidental traumatic thought intrusion, and skin conductance responses in combat-related Posttraumatic Stress Disorder (PTSD). Participants included service members who either: a) had PTSD following an Operation Iraqi Freedom deployment; b) were free of psychiatric diagnosis following deployment (Combat Equivalent), or c) were pre-deployed and without psychiatric diagnosis (Pre-Deployed). PTSD Service Members reported the greatest intrusion of combat thoughts during the suppression task and demonstrated a post-suppression rebound effect with a neutral thought. Non-specific skin conductance responses indicated that the suppression task was related to similar levels of increased sympathetic activity for both the PTSD and Pre-Deployed groups, whereas the Combat Equivalent group showed no increased activation during thought suppression. Intrusive traumatic thoughts combined with failures in neutral thought suppression may be a consequence of increased cognitive load in PTSD.

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Introduction

Intrusive thoughts are an important aspect of Posttraumatic Stress Disorder (PTSD). Horowitz (1986) suggested that traumatic events must be assimilated into the schema of a person's life events. This assimilation process may be inhibited, due to the intense unpleasant arousal of the traumatic event. Assimilation failures are posited to cause "leaks" of traumatic material into consciousness in the form of intrusive thoughts. In accord with recent clinical models of PTSD (Resick & Schnicke, 1992) corrective integration of a traumatic event into the life schema is thought to decrease intrusive thoughts and alleviate PTSD. However, despite its theoretical significance, the cognitive mechanism of thought intrusion has yet to be fully understood.

Information-processing models of thought suppression provide insight into the mechanisms that may underlie intrusive thoughts

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in PTSD. Wegner's (1994) prototypical "white bear" paradigm requires individuals to observe the frequency of a novel target thought (i.e., the "white bear") during task periods that either allow for ("monitor") or discourage ("suppress") its emphasis (Wegner, Schneider, Carter, & White, 1987). Most individuals are successful in actively suppressing a target thought, yet some experience an increase in target thought frequency once the suppression task has ended (a "rebound" effect during a second monitoring task; Wenzlaff & Wegner, 2000). According to the ironic process theory, thought suppression is supported by two cognitive mechanisms: an effortful search system that seeks to engage in thought content other than the target thought and a non-effortful monitoring system that flags instances when the search system has failed (Wegner, 1992). The non-effortful monitoring system operates with automaticity and may continue when the effortful search system has ended. In this manner, the monitoring system identifies the increase in target thoughts following the suppression task, creating the rebound effect.

Preliminary studies of thought suppression in PTSD indicate rebound-related effects with trauma target thoughts. Increased trauma-related thought rebound has been associated with PTSD following sexual assault (Shipherd & Beck, 1999) and motor vehicle accidents (MVA; Shipherd & Beck, 2005). Additionally, negative mood

or distress about the intrusive thought was reported in PTSD participants. Similar rebound effects have been reported with PTSD and treatment-seeking traumatized non-PTSD individuals (Beck, Gudmundsdottir, Palyo, Miller, & Grant, 2006) and traumatized college student samples (e.g., Davies & Clark, 1998; Rosenthal, Cheavens, Lynch, & Follette, 2006; Tull, Gratz, Salters, & Roemer, 2004).

Traumatic thought content may directly lead to suppression rebound effects. Alternatively, evidence of rebound effects with non-trauma thoughts may be reflective of PTSD-related deficits in thought suppression ability. In an effort to determine content specificity in PTSD-related rebound effects, MVA survivors were asked to monitor and suppress both trauma and non-trauma neutral personal thoughts (Shipherd & Beck, 2005). Results indicated only a rebound effect with the trauma thought. This finding is consistent with a model of emotional processing which posits that recent exposure to trauma content may prime PTSD individuals to inhibit responses to incongruent emotional content (Litz, Orsillo, Kaloupek, & Weathers, 2000). In this regard, thinking about the trauma in close proximity to a non-trauma suppression task may decrease access to non-trauma thoughts that results in an absence of a rebound effect. Thus, engaging PTSD participants without a discussion of traumatic thought content prior to a neutral thought suppression task would preclude priming to a trauma context. Although a recent investigation of trauma and neutral thought content attempted to examine this issue (Amstadter & Vernon, 2006), its use of a different suppression methodology (i.e. an initial baseline phase that did not introduce the target thought, which is the usual practice with an initial monitoring phase) confounds suppression with cuing effects manifest in the initial monitoring task. As a result, these findings are rendered in comparable to those reviewed above (see Wenzlaff & Wegner, 2000, for review of methodologies). Thus, the scope of thought suppression rebound effects in PTSD populations remains to be clarified.

An additional aspect of thought suppression that has yet to be considered in the PTSD literature is the role of cognitive load on thought suppression failures. Wegner (1992) proposed that suppression failures occur when task demands (increased task complexity) overwhelm the effortful search system. In studies that utilized a variety of manipulations (time constraints, dual tasks), suppression failures were observed in samples of healthy participants (Wegner & Erber, 1992). Thus, at times of high demand, effortful thought suppression –for a neutral target thought– fails due to competition for cognitive resources (Wenzlaff & Wegner, 2000). We hypothesize that PTSD individuals may engage in an ongoing effortful traumatic thought suppression process in a manner similar to that described by Horowitz (1986). This traumatic suppression process would limit the available cognitive resources for PTSD individuals to engage in other concurrent tasks. Thus, it might be expected that PTSD individuals are prone to trauma thought suppression failures during periods of relatively modest cognitive demand, such as a neutral thought suppression task.

Autonomic sympathetic activity should also be concordant with the cognitive effort required to suppress thoughts. For example, Lacey and colleagues (Lacey, Kagan, Lacey, & Moss, 1963) found increased Skin Conductance Level during a variety of tasks. In a similar manner, non-specific Skin Conductance Responses (NS-SCR), spontaneous skin conductance responses observed over some discrete period of time, have been found to increase in frequency during completion of complex tasks (Munro, Dawson, Schell, & Sakai, 1987). Increases in NS-SCR frequency has been conceptualized as an indicator of heightened autonomic activation that is associated with an effortful allocation of attentional resources (Jennings, 1986). Yet, psycho-physiological monitoring has only been included in one study of PTSD thought suppression (Beck et al., 2006), which used heart rate, skin conductance level, and

frontalis EMG as measures of autonomic arousal in response to traumatic thoughts. Only minimal group differences in these measures were found, such that the PTSD group had elevated EMG during the suppression task relative to the control group. The authors conceptualized their use of the physiological measures as indices of hyper arousal associated with processing traumatic thought content. In this manner, they speculated that the lack of physiological differences between PTSD and non-PTSD groups was possibly related to the shared degree of distress over their trauma and treatment-seeking status, regardless of PTSD diagnosis. Interestingly, there were no reported task-related physiological effects, despite the fact that both groups demonstrated a thought rebound effect. To date, the use of NS-SCR as a measure of autonomic arousal associated with task effort has yet to be utilized in a thought suppression paradigm. Thus, to the extent that thought suppression is an effortful strategy, concomitant increases in NS-SCR should be found during the suppression task.

To our knowledge, the present paper is the first to investigate thought suppression effects in individuals with combat-related PTSD. The specificity of a suppression-related rebound effect was tested with a standard neutral thought task (“the white bear”). Evidence of a rebound effect with a standard neutral thought would further support the conceptualization of a dysregulated thought suppression mechanism in PTSD. Mood and emotional responses to the thought tasks were recorded in an effort to relate these factors as potential covariates to suppression ability. Second, we wanted to explore the consequence of neutral thought suppression to the ongoing frequency of trauma thought intrusions. As suggested above, the added effort to suppress a novel, affectively neutral thought is predicted to deplete the already tapped cognitive resources in PTSD individuals and result in an increase of incidental intrusive trauma thoughts during the suppression task. Finally, we expected to see an increase in NS-SCR activity during the suppression task relative to the monitoring conditions, as an indicator of increased autonomic activation associated with increased cognitive effort. To the extent that PTSD Service Members are engaged in a dual suppression task (both trauma and white bear thoughts) and thus requiring more cognitive resources than non-PTSD groups, they should show greatest NS-SCR activity.

Methods

Participants

The participants were 43 right-handed active-duty male Service Members, between the ages of 19 and 37, based at Fort Drum, New York. All were members of the 10th Mountain Light Infantry Division (LI). Members of this LI Division were among the first troops deployed in Operation Iraqi Freedom (see Table 1 for demographics and diagnostic data). For those participants who served in Iraq, the average length of time back from Iraq following their first 12-month deployment was 8 months ($SD = 5.3$).

Participants were comprised of three groups: 14 who were combat-exposed during deployment to Iraq and subsequently developed PTSD (PTSD group); 14 who were combat-exposed during the Iraq deployment and did not meet criteria for current diagnosis of PTSD or any other Axis I diagnosis (Combat Equivalent group); and 15 who were yet to be deployed to Iraq, not combat-exposed, and did not have a current Axis I diagnosis (Pre-Deployed group). All participants were free from medical complications and were not taking any prescription or over-the-counter medications.

All PTSD participants met criteria for current PTSD via the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995). The control participants did not meet criteria for current Axis I or Axis II disorders as determined by the Structured Clinical Interview for

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