

# Trauma-related and neutral false memories in war-induced Posttraumatic Stress Disorder <sup>☆</sup>

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## Abstract

Recent models of cognition in Posttraumatic Stress Disorder (PTSD) predict that trauma-related, but not neutral, processing should be differentially affected in these patients, compared to trauma-exposed controls. This study compared a group of 50 patients with PTSD related to the war in Bosnia and a group of 50 controls without PTSD but exposed to trauma from the war, using the DRM method to induce false memories for war-related and neutral critical lures. While the groups were equally susceptible to neutral critical lures, the PTSD group mistakenly recalled more war-related lures. Both false and correct recall were related more to depression than to self-rated trauma. Implications for accounts of false memories in terms of source-monitoring are discussed.

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As a result of exposure to severe trauma, some people develop a relatively stable, potentially chronic disorder called Posttraumatic Stress Disorder (PTSD). Over recent years, several models of cognitive functioning in PTSD have been articulated (Brewin, 2001; Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000). In the latter model, for example, Ehlers and Clark (2000) propose a set of cognitive dynamics that lead to the maintenance of persistent PTSD, involving the use of strategies with which the person attempts to keep unpleasant mental intrusions to a minimum, and that paradoxically make their elimination more difficult.

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In these models, trauma exposure per se is not enough to produce and maintain PTSD: particular cognitive patterns that only arise in some trauma-exposed people are necessary to produce that. Furthermore, cognitive differences between people with PTSD and trauma-exposed people without PTSD will be amplified when the content of the cognitions is trauma-related. That is, PTSD is assumed to have effects on cognitions thematically related to the traumatising event. Therefore, a general prediction of Ehlers and Clark's framework is that trauma-related cognition should be particularly impaired for PTSD patients. From studies of PTSD and memory function, there is ample evidence of a deficit in short- and long-term memory for emotionally neutral material in PTSD patients versus trauma-exposed controls (for a review, see Buckley, Blanchard, & Neill, 2000). There are, however, fewer studies that have used trauma-related materials with PTSD patients in tasks tapping semantic memory. Golier, Yehuda, Lupien, and Harvey (2003) showed that although survivors of the Holocaust with PTSD recalled fewer paired associates than Holocaust survivors without PTSD, regardless of whether they were trauma-related or emotionally neutral, the disadvantage was smaller for the trauma-related pairs, which can be seen as consistent with Ehlers and Clark's prediction.

One of the positive outcomes of the "greatest psychological controversy of the 1990s" (Lindsay & Read, 2001), the so-called memory wars, has been the development and widespread use of paradigms demonstrated to get false memories under laboratory control. Roediger and McDermott (1995) revived a paradigm by Deese (1959) wherein participants try to remember lists of words, with the members of each list being associatively related to a non-presented target word, the so-called "critical lure". For example, a standardized list with the non-presented critical lure "sleep", begins "bed, rest, awake, tired" (Stadler, Roediger, & McDermott, 1999). On both recognition and free recall tasks, participants mistakenly claim that the critical lure was presented in the study list, often at rates comparable to that of words that were actually presented. Moreover, when asked for a rating of how sure they were that the word was actually presented, it is evident that on a variety of different measures (Remember/Know, confidence), "memory" for the non-event is compelling. This paradigm, often called the DRM paradigm, is thus a productive way of eliciting false memories in the laboratory context.

False memories in this paradigm are often seen as source-monitoring errors (see e.g., Brédart, 2000; Schacter, Verfaellie, & Pradere, 1996). The presentation of a series of words all thematically related to the same lure word conjures it up in the participant's mind. Then, in the recall test, if the participant recalls the lure word but fails to correctly classify it as self-generated, rather than actually presented, a false memory occurs.

There is reason to believe that PTSD patients may have a particular impairment in source-monitoring, and thus a tendency towards higher production of false memories, due to an association between the disorder and dissociation. For instance, Bremner et al. (1992) demonstrated a link between war-induced PTSD and dissociation, and Winograd, Peluso, and Glover (1998) showed that dissociative symptoms were positively correlated with susceptibility to false memories on a DRM task. Thus a source-monitoring account would predict that PTSD patients should produce more false recall of critical lures on a DRM task.

In fact, two studies have used the DRM paradigm with trauma-exposed people, a subset of whom had developed PTSD as a consequence, plus a group of individuals who had not experienced a severe trauma (Bremner, Shobe, & Kihlstrom, 2000; Zoellner, Foa, Brigidi, & Przeworski, 2000). Both studies used Roediger and McDermott's (1995) materials, and tested memory for the words by recognition and free recall. In a recognition test, Zoellner et al. found that the PTSD group did not significantly differ from the non-PTSD group on either correctly recognizing presented words or on falsely recognizing critical lures. Bremner et al. also reported no difference between the groups for correct recognition but found that the PTSD group falsely recognised more critical lures than other trauma-exposed participants. When comparing the two trauma-exposed groups on correct recall of words, Zoellner et al. reported no difference, whereas Bremner et al. found that PTSD patients recalled fewer words than participants without PTSD. On numbers of critical lures mistakenly recalled, neither study reported significant differences between the two groups, and in both cases the trend was actually for non-PTSD participants to recall more lures.

The present experiment was aimed at investigating this discrepancy between the results on correct recall of words from DRM lists. Furthermore, to shed more light on the unexpected finding in both previous studies of this issue that trauma-exposed groups have equivalent susceptibility to recall critical lures. In addition, a novelty of the present study was that trauma-related DRM lists were used, in addition to lists similar to Roediger and McDermott's (see Geraerts, Smeets, Jelicic, van Heerden, & Merckelbach (2005), for a similar and independent development of trauma-related DRM). To the extent that studies show that PTSD patients and trau-

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