



## Overgeneral autobiographical memory recollection in Iranian combat veterans with posttraumatic stress disorder

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### ABSTRACT

This study examined the recollection of autobiographical material in memory among Iranian military veterans with and without posttraumatic stress disorder (PTSD), and healthy non-trauma-exposed control subjects. Participants completed the Autobiographical Memory Test, Autobiographical Memory Interview (counterbalanced), Impact of Event Scale-Revised, Beck Depression Inventory-II, Wechsler Memory Scale-III and Wechsler Adult Intelligence Scale-Revised. The PTSD group generated fewer specific episodic and semantic details of autobiographical memory compared to the non-PTSD and control groups. Working memory did not significantly moderate the relationship between PTSD diagnosis and reduced autobiographical memory specificity but did moderate the relationship between PTSD diagnosis and semantic recall; semantic memory recall was not significantly related to working memory ability for those with PTSD but was related to working memory ability for trauma survivors without PTSD. While the data provide some support for the expectation that higher working memory ability is associated with an increased ability to retrieve specific memories (i.e. semantic memory recall in those without PTSD), the findings are also consistent with the view that for those with PTSD the demands on working memory required for affect regulation cancel out this influence of working memory in augmenting access to specific memories.

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Posttraumatic Stress Disorder (PTSD) is a debilitating anxiety disorder afflicting significant numbers of survivors of major psychological trauma (American Psychiatric Association, 2000). The hallmark symptom of PTSD is the intrusive recollection of memories of the traumatic experience. These intrusions often occur as vivid, highly emotive, sensory-laden flashbacks and reliving experiences (Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000), but also as nightmares, intrusive thoughts and images, and in the form of psychological and physiological distress when encountering trauma reminders (American Psychiatric Association, 2000). Profound attempts to prevent such involuntary access to the trauma memory manifest as the avoidance symptoms of PTSD, including efforts to not talk about or think about the trauma, evasion of reminders, and in some cases emotional numbing and psychogenic amnesia (American Psychiatric Association, 2000).

This elevated involuntary access to memories of the trauma in PTSD survivors is often accompanied by compromised *voluntary* access to coherent accounts of what happened during traumatic experiences (Brewin, 2011). Such trauma accounts are thus often fragmented, temporally disorganised and laden with sensory-perceptual features (Brewin et al., 1996; Foa, Molnar, & Cashman, 1995; Jelinek, Randjbar, Seifert, Kellner, & Moritz, 2009; O'Keary & Perrott, 2006). In a related vein, sufferers of PTSD find it relatively more difficult to access specific details of autobiographical memories of events from their past other than the trauma itself – a phenomenon referred to as reduced autobiographical memory specificity (AMS) (e.g. Hauer, Wessel, Geraerts, Merckelbach, & Dalgleish, 2008; McNally, Lasko, Macklin, & Pitman, 1995; McNally, Litz, Prassas, Shin, & Weathers, 1994; Schönfeld, Ehlers, Bollinghaus, & Rief, 2007; see Moore & Zoellner, 2007 and Williams et al., 2007, for reviews).

There is now substantive evidence that reduced AMS in sufferers of PTSD, including impoverished voluntary access to trauma memories themselves, has important implications for the functionality of everyday cognition. Firstly, reduced AMS in PTSD is associated with impaired daily problem-solving (Sutherland &

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Bryant, 2008) as a function of the fact that problem resolution almost always benefits from retrieval of specific past instances of similar situations and how they were addressed. Secondly and related, reduced AMS about the past is strongly associated with a difficulty imagining specific events in the future (e.g. Williams et al., 1996) with a consequent impact on the ability to effectively plan daily life. Thirdly, difficulty accessing specific information about the past, including about the trauma, interferes with the ability to update and re-script the trauma memory – processes known to be integral to recovery from PTSD, especially within therapy (e.g. Wheatley, Hackmann, & Brewin, 2009). Given these relationships between reduced AMS and cognitive function, it is unsurprising that reduced AMS has been found to predict poorer posttraumatic stress symptom outcomes in longitudinal studies in trauma survivors, over and above current PTSD symptom levels. For example, Kleim and Ehlers (2008) found that reduced AMS in trauma survivors two weeks after an assault predicted PTSD six months later (see also Harvey, Bryant, & Dang, 1998). These various data strongly suggest that reduced AMS is more than an epiphenomena of PTSD.

What is the relationship between enhanced involuntary access to trauma memories, impoverished voluntary access to coherent details of those same memories, and a more global impairment in retrieving specific personal memories in survivors of PTSD? An influential theoretical account has been put forward by Williams and colleagues (see Williams, 2006; Williams et al., 2007), a key component of which is the Affect Regulation Hypothesis—a proposal for which there is burgeoning empirical support (e.g. Hermans, Defranc, Raes, Williams, & Eelen, 2005; Hermans et al., 2008; Kuyken & Brewin, 1995; see Moore & Zoellner, 2007, and Sumner, 2012, for reviews). The Affect Regulation Hypothesis utilises mainstream cognitive models of autobiographical memory such as the Self Memory System Model (Conway, 2005; Conway & Pleydell-Pearce, 2000) as a framework to conceptualise the repeated attempts to preclude the involuntary intrusion of specific details of the traumatic experience in sufferers of PTSD. According to such models, the autobiographical memory database is represented hierarchically with general summaries of broad categories of life experience and/or lifetime periods at the top and increasingly specific details of individual events at the bottom. Voluntary retrieval of specific event details generally requires navigating down the hierarchy and is cognitively effortful requiring executive and working memory (WM) resources. Such voluntary specific memory recollection can be aborted or compromised by diverting retrieval towards general representations of the past that are stored higher in the hierarchy and are thus more readily accessible. Specific memory retrieval can also be compromised, according to such models, when executive and WM resources are low as there is insufficient capacity to maintain the hierarchical search. Williams et al. (2007) argue that, in sufferers of PTSD, attempts to avoid the recollection of specific details of the trauma involve diverting the hierarchical memory search in just this way towards these higher-level generic representations of personal experience. A consequence of this over time is that not only do coherent details of the trauma itself become difficult to access voluntarily, but *all* specific memory access becomes compromised as this emphasis on generic autobiographical retrieval becomes inflexible and habitual (Williams et al., 2007).

The key question of course is whether, for PTSD sufferers, this reconfiguration of the autobiographical memory system search process in favour of generic information succeeds in reducing the frequency of occurrence of intrusive trauma memories. This does not appear to be the case. Intrusive involuntary recollection of specific events appears to involve 'direct access' to specific event representations in the memory hierarchy thus bypassing the

hierarchical search that underpins voluntary retrieval (Conway, 2005; Conway & Pleydell-Pearce, 2000). Consequently, avoidant cognitive strategies that divert hierarchical search towards generic representations appear to have little impact on involuntary intrusions and if anything such intrusions appear to be higher in those with reduced AMS (Williams et al., 2007).

The fact that reduced AMS seems to have no adaptive role in ameliorating symptoms, is associated with a range of other impairments in day-to-day mental functioning, and is prognostic of poor clinical outcome across a number of clinical disorders, including PTSD (Williams et al., 2007), has motivated the development of low intensity clinical interventions targeted at enhancing AMS to counteract and potentially reverse these latter difficulties. The nature of reduced AMS is most clearly understood in relation to depression. Consequently, initial attempts at intervention development have focused on depressed patients with Raes and colleagues' four session pilot programme of Memory Specificity Training (MEST) showing promising results (Raes, Williams, & Hermans, 2009). MEST also has considerable promise for populations with PTSD where we already know that AMS improves following successful treatment of PTSD using cognitive behaviour therapy (CBT) (Sutherland & Bryant, 2007). However, our understanding of the boundary conditions of reduced AMS in PTSD lags behind that in depression and so it is important to continue to elucidate the nature of the phenomenon to provide as strong a platform as possible to support these putative clinical developments.

In particular, there are two further important aspects of the Williams et al. (2007) model that are relatively unexplored in sufferers of PTSD and that are the focus of the present study. The first is the prediction that reduced AMS should be accompanied by reduced access to semantic information about the self as such access is mediated by common hierarchical mechanisms. There is some support for this in unselected samples of trauma survivors (Meesters, Merckelbach, Muris, & Wessel, 2000; Moradi, Herlihy, Yasseri, Turner, & Dalgleish, 2008) but none using a sample with PTSD and none looking at associations with reduced AMS.

The second issue concerns the relationship between individual differences in the capacity of WM and the extent of reduced AMS in sufferers of PTSD. In depression there is now clear evidence that WM moderates levels of AMS with lower WM being associated with reduced specificity (Dalgleish et al., 2007), presumably as a function of the proposed key role WM plays in instigating and controlling hierarchical memory searches (Conway, 2005). Although there is good evidence that WM is compromised in PTSD (e.g. Koso & Hansen, 2006; Samuelson et al., 2009), the predictions about how this will influence AMS are less clear. It is possible that the relationship will mimic that in depression with lower WM being associated with reduced AMS. However, as reduced AMS is believed to function in the service of affect regulation in PTSD, as already discussed (Williams et al., 2007), and we know that affect regulation is demanding of WM (Schmeichel, Volokhov, & Demaree, 2008), one could also argue that reduced AMS may be associated with *greater* levels of WM in those with PTSD. Finally, these two opposing demands on WM, driven by the task instructions and the desire to regulate affect, could cancel each other out resulting in a null relationship between WM and AMS. The exact nature of this relationship is important to resolve because there is gathering evidence that WM ability can be ameliorated in the clinic through systematic cognitive training and that such training gains can transfer to improvements in the processing of emotional material (Schweizer, Hampshire, & Dalgleish, 2011). Understanding how WM relates to reduced AMS in PTSD will clarify whether WM training is likely to help as an adjunctive component of therapeutic efforts to augment AMS in this population.

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