



Working memory capacity and suppression of intrusive thoughts

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Abstract

We sought to show that individual differences in working memory capacity are related to the ability to intentionally suppress personally relevant intrusive thoughts, and that this effect cannot be explained by differences in negative mood. Sixty participants identified their most frequent intrusive thought and then completed a thought suppression task. Better performance on a measure of working memory capacity (OSPAN) was related to having fewer intrusions in the suppression condition but was unrelated to number of intrusions in the expression condition, suggesting a specific association with attempts to inhibit unwanted thoughts. In contrast, a more negative mood was related to having more intrusions in both conditions, suggestive of a more general influence on the accessibility of unwanted thoughts. Working memory capacity was not associated with negative mood or with the frequency of intrusive thoughts reported in everyday life. The findings extend previous results to the domain of personally relevant intrusive thoughts and support the idea that individual differences in the cognitive abilities supporting inhibitory mechanisms are relevant to clinical conditions such as obsessive-compulsive disorder and posttraumatic stress disorder.

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1. Introduction

Most psychiatric disorders are accompanied or defined by the presence of intrusive cognitions that enter consciousness involuntarily, impair concentration, and disrupt task performance. For example, posttraumatic stress disorder (PTSD) is accompanied by a variety of intrusive cognitions including episodic memories, flashbacks, ruminative thoughts, and elaborated images (Brewin, 2003; Ehlers & Steil, 1995; Steil & Ehlers, 2000; Reynolds & Brewin, 1998). An important question concerns whether there are systematic differences between people in their general vulnerability to experience unwanted intrusive cognitions. Working memory capacity reflects individual differences in the extent to which controlled attention can be brought to bear on the execution of a wide range of tasks including the exclusion of unwanted or irrelevant material from consciousness. In a previous article (Brewin & Beaton, 2002) we showed that under experimental conditions participants with greater working memory capacity were better able to suppress thoughts of a white bear. This study tests the hypothesis that working memory capacity is also related to the ability to exclude personally relevant thoughts of the kind that are common in patients with PTSD or obsessive-compulsive disorder (OCD).

Working memory capacity is thought to reflect individual differences in the efficiency of short-term memory storage coupled with controlled attention, and is related to people's ability to maintain or bring to focus memory representations in the face of distraction or interference, to switch attention between alternative representations, and to manipulate those representations. In terms of Baddeley & Hitch's (1974) working memory model it reflects the operation of the central executive together with a short-term storage component such as the phonological loop. Working memory capacity is measured by tasks that require items to be remembered while the person is simultaneously performing a separate operation such as verifying that an arithmetic string is correct.

Recently, studies have focused on the relation of working memory to the suppression of irrelevant or distracting representations or to their removal from focus. According to this approach, inhibition or suppression are seen as effortful activities that must compete for limited resources (Conway & Engle, 1994). For example, de Fockert, Rees, Frith, and Lavie (2001) had their participants classify famous written names as pop stars or politicians while ignoring distractor faces. They demonstrated that loading participants' working memory with a secondary task (remembering a sequence of digits) resulted in them suffering greater interference from the distractor stimuli. Rosen and Engle (1998) investigated the relation of suppression or inhibition to individual differences in working memory. They had participants learn a series of three paired associate lists, in which the initial word was always the same but the second word changed from list 1 to list 2 and then reverted to the original in list 3 (e.g., bird-bath, bird-dawn, bird-bath). In the first experiment, individuals with greater working memory capacity suffered from fewer intrusions of inappropriate list 1 responses when learning list 2, and learned list 2 more quickly. In the second experiment, these same individuals were slower to re-learn the list 3 pairs, suggesting that they had more successfully suppressed them in order to facilitate learning of the second list.

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