

The Influence of Thought Suppression and Cognitive Load on Intrusions and Memory Processes Following an Analogue Stressor

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Ironic Process Theory and the role of thought suppression have been used in part to explain the phenomenon of intrusive memories in various disorders, including posttraumatic stress disorder. How thought suppression interacts with other cognitive processes believed to be instrumental in the development of traumatic intrusive memory is unclear. In an analogue study, thought suppression and cognitive processing was manipulated in 4 experimental groups after participants ($n=80$) viewed a trauma film. The impact of suppression was examined in relation to self-reported intrusive experiences as well as via more objective methods (word stem and dot probe tasks) to assess potential preferential encoding of negative material. Cognitive load appeared to undermine thought suppression ability, with these participants experiencing more intrusions over the week relative to participants in all other conditions. This group also showed greater priming to negative film-related words, and both suppression groups demonstrated enhanced memory for film-related content on recognition testing. Thought suppression mediated the relationship between negative interpretations of initial intrusions and later intrusions experienced over the week. The findings are

discussed in the context of ironic process theory and cognitive models of posttraumatic stress.

UNWANTED THOUGHTS AND MEMORIES are common experiences after traumatic events and some individuals will develop significant clinical disorders such as acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) following such events (American Psychiatric Association, 1994). The paradoxical phenomenon of thought suppression leading to the maintenance of thoughts and imagery in both clinical and nonclinical populations has often been understood within the framework of Wegner's Ironic Process Theory (IPT; Wenzlaff & Wegner, 2000). IPT is also an implicit component of cognitive models of posttraumatic stress (e.g., Ehlers & Clark, 2000). IPT not only provides a framework within which to understand the classic thought suppression "rebound" effect, but it also describes processes relevant to meta-cognition that may influence thought suppression, as well as explaining why thought suppression may increase accessibility to the to-be suppressed target. These processes (and others) have direct relevance to understanding intrusion development in the context of posttraumatic stress. There is a significant body of literature on thought suppression (see Abramowitz, Tolin, & Street, 2001; Purdon, 1999; Rassin, Merckelbach, & Muris, 2000; Wenzlaff & Wegner, 2000), and a number of studies have employed thought suppression paradigms with traumatized

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samples, although these studies have focused simply on the occurrence of intrusions following suppression, not the underlying mechanisms that might influence thought suppression success or failure (e.g., Guthrie & Bryant, 2000; Harvey & Bryant 1998; Shipherd & Beck, 1999). To date, there has been a little experimental work aimed at better understanding how thought suppression might interact with other cognitive processes thought to influence intrusion development.

Driven by cognitive models of posttraumatic stress (e.g., Brewin, 2001; Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000), experimental and clinical research has demonstrated that differences in peritraumatic processing account for different experiences of traumatic memories. For example, studies that have manipulated peritraumatic processing while participants watch an unpleasant film provide evidence that the occurrence of intrusions can be increased or decreased by placing differential cognitive loads on verbal (e.g., counting backwards in threes) and visual-spatial (e.g., tapping out a spatial pattern) processing systems, respectively (e.g., Holmes, Brewin, & Hennessy, 2004; Nixon, Nehmy, & Seymour, 2007).

A current gap in the literature, however, is that this research has focussed on peritraumatic processing. Whether these processes continue to play an influential role *after* the event is over (i.e., post-event processing) is unclear as there has been little experimental attention paid to this matter, which is somewhat surprising given that individuals who experience a real traumatic event often are exposed to multiple occasions of intrusive experience with which to further process and understand their traumatic memory. Related to this issue is that although different types of cognitive processing have been studied in the context of traumatic intrusions, this body of research has not simultaneously studied how these processes are impacted by thought suppression. Given thought suppression (and other avoidance symptoms) is a commonly used strategy among persons with PTSD, and that several nontrauma analogue studies have shown that thought suppression can be undermined by increasing cognitive load during tasks (e.g., Wegner & Erber, 1992; Wenzlaff & Bates, 2000), it seems relevant to examine these variables in conjunction. Indeed, the detrimental impact of a secondary cognitive task on thought suppression should not be surprising given that thought suppression is an effortful, capacity-limited process. Several studies (e.g., Brewin & Beaton, 2002; Brewin & Smart, 2005) have demonstrated that those with good working memory (i.e., a capacity for engaging in

multiple cognitive tasks) seem to be more successful at thought suppression.

An additional gap in the trauma-intrusion experimental literature is that in nontrauma designs, thought suppression appears to increase the accessibility of the information that the individual is trying to suppress when cognitive load demands are placed on the individual (Wegner & Erber, 1992; Wegner, Erber, & Zanakos, 1993; Wenzlaff & Bates, 2000). This increased accessibility has been shown using objective measurement (such as Stroop tasks or unscrambling sentence tasks); thus, thought suppression has the paradoxical effect of not only increasing the *frequency* of intrusive experiences, but it also appears to increase one's *accessibility* to information associated with the to-be-suppressed thought/memory. Whether thought suppression has this effect in trauma or trauma-analogue samples has not been investigated.

In one of the first studies to examine post-event processing in the context of thought suppression in an analogue trauma design, Nixon, Cain, Nehmy, and Seymour (2008) failed to observe that cognitive load undermined the success of thought suppression. Although the authors raised the possibility that under some circumstances thought suppression may have a beneficial short-term effect, they emphasized the need for replication given the study was the first of its type. Additionally, the study relied solely on self-reported occurrences of intrusions and thus would have benefited from inclusion of more objective measures of the impact of thought suppression. There is quite consistent evidence that individuals with PTSD seem to preferentially encode and attend to threatening or trauma-related stimuli, and there are a number of experimental tasks that can be used to index such biases (e.g., Stroop, dot-probe and word priming tests; Buckley, Blanchard, & Neill, 2000; Michael, Ehlers, & Halligan, 2005). Therefore researchers are in a position to more objectively study whether thought suppression increases accessibility to "to-be-suppressed" information, and in the context of trauma research, to investigate how this might be influenced by other cognitive processes. In recent years, researchers have found that manipulating cognitive processing in trauma intrusion studies generally does not interfere with organization, recall, or recognition of trauma information (Halligan, Clark, & Ehlers, 2002, Study 2; Holmes et al., 2004; Rassin, Merckelbach, & Muris, 1997). This is consistent with the proposal that certain cognitive processes can either assist or hinder adaptive possessing, rather than such processes being viewed universally as a protective form of distraction. At this time, it remains to be seen whether manipu-

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