

What springs to mind

An investigation into the neural and phenomenological characteristics of involuntary and voluntary conscious memories

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ABSTRACT

A positron emission tomography (PET) study and two behavioural studies were carried out at the PET Centre, Aarhus University hospital and Department of Psychology, University of Aarhus with the aim of investigating involuntary memory retrieval. Involuntary memories are recollections of previous events that arise in consciousness with no prior retrieval attempt. Such memories are common in everyday life, and in posttraumatic stress disorder (PTSD), repetitive and distressing involuntary memories of the traumatic experience are a central diagnostic criterion. Studies of involuntary memory in healthy individuals using moderately aversive pictorial stimuli have been used to advance cognitive PTSD theory, which states that involuntary recall, compared to voluntary (intentional) recall, gives privileged access to information related to particularly stressful episodes. Intense stress is assumed to impair the function of the hippocampus, a brain structure involved in the establishment of connections between different elements of consciously apprehended episodes during encoding and later retrieval. It has been claimed that the hippocampus is not involved in the generation of involuntary trauma memories and that the recalled information therefore has undergone relatively poor conceptual processing. As a consequence, involuntary memories are thought to be more emotionally intense and rich in perceptual detail than voluntarily memories. However, because experimental psychologists have generally evaded the phenomenon of involuntary memory, the alleged differences between involuntary and voluntary memories have not been verified experimentally.

Together, our behavioural and brain imaging studies demonstrate that retrieval intent does affect the properties of episodic memories, although not entirely in a manner predicted by existing theories. The reported results support the claim that voluntary recall gives access to more conceptualized information and that emotional information is activated more strongly through involuntary recall. However, counter to predictions based on PTSD theory, the results suggest that voluntary memories in fact involve more imagery than involuntary memories. Also in contrast to PTSD theory, the hippo-

campus is shown to be equally involved in involuntary and voluntary recall of emotionally salient material. On the basis of these first comparisons of experimenter-created involuntary and voluntary memories, it is suggested that cognitive PTSD theory may need reconsideration. Alternatively, knowledge obtained from studies of experimenter-created memories in healthy subjects can not be transferred directly to PTSD patients' processing of trauma memories.