



Autobiographical memory for stressful events: The role of autobiographical memory in posttraumatic stress disorder

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ABSTRACT

To provide the three-way comparisons needed to test existing theories, we compared (1) most-stressful memories to other memories and (2) involuntary to voluntary memories (3) in 75 community dwelling adults with and 42 without a current diagnosis of posttraumatic stress disorder (PTSD). Each rated their three most-stressful, three most-positive, seven most-important and 15 word-cued autobiographical memories, and completed tests of personality and mood. Involuntary memories were then recorded and rated as they occurred for 2 weeks. Standard mechanisms of cognition and affect applied to extreme events accounted for the properties of stressful memories. Involuntary memories had greater emotional intensity than voluntary memories, but were not more frequently related to traumatic events. The emotional intensity, rehearsal, and centrality to the life story of both voluntary and involuntary memories, rather than incoherence of voluntary traumatic memories and enhanced availability of involuntary traumatic memories, were the properties of autobiographical memories associated with PTSD.

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1. Introduction

Psychology has long tried to understand how extremely stressful, negative, and traumatic events affect memory. Freud's theories of repression have continued through works such as Horowitz (1976), and Janet's (1907) theories of dissociation through works such as of Van der Kolk and Fisler (1995). A common idea from these classic theories is that memories of trauma are different from other memories and require special mechanisms (for a critical review of this history, see McNally, 2003, pp. 159–185). In general terms, for these theories, high levels of emotion contribute to incomplete initial processing of the trauma producing an incomplete, fragmented, incoherent memory of the traumatic event, which is stored separately from other memories. A lack of complete processing keeps the memory active and often intrusive while attempts are made to integrate it into a more coherent form. Thus, the memory may come involuntarily, but be difficult to retrieve in a voluntary fashion. Two current manifestations of these views are Brewin's dual representation theory (Brewin, Dalgleish, & Joseph's 1996; Brewin, Gregory, Lipton, & Burgess, 2010) and Ehlers and Clark's (2000) cognitive model of PTSD (see Brewin & Holmes, 2003; Dalgleish, 2004 for reviews).

An efficient way to study memory for traumatic events is to use the existing diagnosis of posttraumatic stress disorder (PTSD). The diagnostic system provides measures of common symptoms in which a diagnosis of PTSD hinges on severity and duration. Thus, contrasting people with and without PTSD provides a range of responses including ones severe enough

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to be considered psychopathological. The current DSM-IV-TR diagnosis (American Psychiatric Association, 2000, pp. 467–468) includes 17 symptoms divided into three categories: the reliving, avoidance, and arousal symptoms. It is clear from these symptoms that autobiographical memory is central to the PTSD diagnosis in a way that is consistent with the classic theories of PTSD. In particular, the five reliving symptoms refer to repeated, disturbing thoughts, images, or dreams of traumas that come to mind involuntarily and with a strong sense of reliving and that change one's mood and create physiological reactions. Two avoidance symptoms require avoiding thoughts, conversations, or situations that might cue such involuntary memories of the trauma and a third refers to voluntary memory, which rather than being enhanced, is marked by an inability to willfully recall important parts of the trauma. Thus, the symptoms of PTSD that refer to memory indicate a problem in the enhanced availability and emotional content of unbidden or involuntary memories of traumas coupled with their incomplete voluntary memory (for a review see Berntsen, Rubin, & Bohni, 2008).

It is also clear from these symptoms that autobiographical memory in general and not just memories of the trauma are affected. Although trauma exposure is a requisite for a diagnosis of PTSD, it is unlikely on theoretical and empirical grounds that changes in autobiographical memory occur for just trauma-related memories and not for autobiographical memories in general (Rubin, Boals, & Berntsen, 2008). Reliving, avoidance, and arousal symptoms do not function with pinpoint accuracy to the trauma memory in isolation but extend to memories related to it in many ways from low level direct perceptual matches to the very abstract and symbolic similarities. Even repetitive intrusive memories do not have to repeat verbatim, but can relate to different aspects of a trauma (Berntsen & Rubin, 2008). Avoidance symptoms extend to avoiding situations a neutral observer may not think would be reminders of the trauma. Arousal symptoms involving hypervigilance extend to more than appropriate trauma related vigilance, and the increased startle response symptom occurs to stimuli unrelated to the trauma. Thus, from the symptoms and diagnosis of PTSD, there is good reason to examine changes in autobiographical memory in general rather than concentrating on the special properties of trauma memories as do the classic theories and more modern theories deriving from them.

The importance of autobiographical memory to the PTSD diagnosis and a shift in emphasis from the trauma memory to the autobiographical memory in general allows the principles of cognitive psychology to inform the more classic views of memory of trauma. To do this, we obtain a full description of theoretically relevant properties of autobiographical memories in conditions that contrast three central theoretical oppositions: PTSD versus control participants, traumatic versus comparison memories, and voluntary versus involuntary memories. We thereby provide the first comprehensive study of the properties of autobiographical memories using a clinically diagnosed PTSD population, one that has the comparisons needed to evaluate competing theories. We also provide the first detailed study of involuntary memories made as they occur, as opposed to retrospectively, in participants with and without PTSD, thereby avoiding the problems of retrospective reports (Berntsen, 2009; Ericsson & Simon, 1993).

This study tests a well developed theory, which was published prior to the data reported here being available (Rubin, Berntsen & Bohni, 2008; Rubin, Boals, & Berntsen, 2008); it has widely tested measures of memory based on a coherent published view of autobiographical memory (Rubin, 2006); and it tests 20 theoretically motivated predictions. However, it is a conceptually difficult study because its design violates many expectations. First, we study both individual differences and experimental manipulations (Cronbach, 1957). Second, we specify multiple mechanisms that operate on different properties of memories. Third, we make a multitude of predictions. This complexity, however, is necessary if the complex phenomenon of memory and emotion for stressful events is to be understood.

1.1. *The autobiographical memory theory of PTSD (AMT)*

In the four decades since the initial formulation of the PTSD diagnosis, there have been advances in our knowledge of cognition, affect, and autobiographical memory. This knowledge leads to different predictions than our earlier understanding. We developed the AMT based on this knowledge and refined it using experiments with undergraduates who varied in the severity of their PTSD symptoms but who had no formal diagnosis (Berntsen, 1996; Berntsen & Rubin, 2006, 2007, 2008; Berntsen, Willert, & Rubin, 2003; Berntsen et al., 2008; Rubin, 2006; Rubin, Boals, & Klein, 2010; Rubin, Berntsen, et al., 2008; Rubin, Boals, et al., 2008). In simplest terms, the AMT predicts what happens when an extremely stressful or traumatic event is experienced by people with different cognitive and emotional styles.

The AMT has three factors to predict reactions to stressful events. Except to explicate details of the factors and how they reinforce each other, there is nothing more to the theory. Each of the three factors is shown on one of the three dimensions of Fig. 1. Each factor taken in isolation has enough empirical support from studies of cognition, emotion, and personality to have its predictions border on the obvious. Nonetheless, these factors, which apply to all memories rather than just trauma-related memories, are not commonly considered as the primary factors underlying PTSD symptoms nor are the extreme reactions of involuntary trauma-related memories in people with PTSD usually considered as just the result of the combination of these factors. To the extent that these three factors combine to account for symptoms of PTSD, more complex theories are superfluous and the explanations become special cases of broader theories from general psychology.

The three cognitive and affective mechanisms central to the availability factor of the AMT are shown on the vertical axis of Fig. 1. All three apply to all autobiographical memories, whether trauma related or not. All three increase the ease with which the memories will come to mind in the future, that is their availability (Tversky & Kahneman, 1973) or accessibility (Tulving & Pearlstone, 1966). They are: (1) the emotional intensity of the memory; (2) when and how often the memory has been retrieved in the past, as measured here by the retrospective reported frequency of voluntary and involuntary recall; and

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