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# Dissociation and memory fragmentation: experimental effects on meta-memory but not on actual memory performance

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## Abstract

The relation between state dissociation and fragmentary memory was investigated by assessing both actual memory performance and meta-memory. From a sample of 330 normal subjects, two subsamples were selected on basis of trait dissociation, as measured by the Dissociative Experience Scale. Twenty subjects scoring above 30 and 20 subjects scoring below 10 were selected. Subjects watched an extremely aversive film, after which state dissociation was measured by the Peri-traumatic Dissociative Experience Scale. Four hours later memory fragmentation was assessed in two ways. *Actual* fragmentation was measured by a sequential memory task, and *perceived* fragmentation (meta-memory) was measured using a visual analogue scale. Subjects who tended to dissociate during the film judged their recollections of the film as more fragmentary. Although this finding is in line with clinical reports given by trauma victims, it was not sustained by objective evidence. That is, no effect was observed of state dissociation on the sequential memory task. The present findings suggest that the claim that dissociation induces memory fragmentation may have to be confined to meta-memory. Implications of this divergence between actual memory and meta-memory are discussed.

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*Keywords:* Dissociation; Memory; Fragmentation; Actual memory performance and meta-memory

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## 1. Introduction

Extremely stressful events may cause serious psychological problems, including Posttraumatic Stress Disorder (DSM-IV, PTSD). Although most trauma victims report PTSD symptoms immedi-

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ately after experiencing a trauma, only a proportion of victims show persistent symptoms and develop PTSD (Foa & Riggs, 1995). An important question is which factors determine the maintenance of PTSD symptomatology. Dissociation at the time of the trauma and during the first month after the trauma seems to be one of the best predictors of long-term PTSD symptomatology (e.g. Bremner et al., 1992; Bremner & Brett, 1997; Cardeña & Spiegel, 1993; Carlson & Rosser-Hogan, 1991; Ehlers, Mayou, & Bryant, 1998; Freedman, Brandes, Peri, & Shalev, 1999; Koopman, Classen, & Spiegel, 1994; Marmar et al., 1994, 1999; Shalev, Peri, Canetti, & Schreiber, 1996; Shalev et al., 1998; Spiegel & Cardeña, 1991; Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996; Ursano et al., 1999). This so-called ‘peri-traumatic dissociation’ refers to depersonalisation, derealisation, out of body experience, altered time perception and analgesia (numbing) (see Marmar et al., 1994). Although there is substantial evidence that peri-traumatic dissociation is related to the development of PTSD, few experimentally controlled studies have been done on the pathogenic mechanism that may explain why peri-traumatic dissociation predicts subsequent PTSD. Memory processes may provide a plausible candidate.

Trauma victims who develop PTSD are supposed to have difficulties in organising the traumatic memory into a coherent narrative with an ordered sequence of events [see for a review Esterling, l’Abate, Murray, & Pennebaker (1999)]. The nature of their traumatic memories are suggested to be fragmented or disorganised and patients are held to have difficulty recalling the exact temporal order of events (e.g. Foa & Riggs, 1993; van der Kolk & Fisler, 1995; Amir, Stafford, Freshman, & Foa, 1998; but see also Shobe & Kihlstrom, 1997). For instance, clinical observations of rape victims suggest that the memory of the assault includes often fragmented representation of the perpetrator as well as those of the victim, like bodily sensations (e.g. pain, touch, smell) and thoughts that reflect attempts to make sense of the event (Foa & Riggs, 1993). These fragmentary memory representations of the traumatic event are held to be later expressed as uncontrollable intrusions that mainly consist of sensory impressions and intense emotional experiences (see also Ehlers & Clark, 2000).

It has been claimed that dissociation during the traumatic event is related to fragmentation of traumatic memories (e.g. Spiegel & Cardeña, 1991; van der Kolk & Fisler, 1995). A possible explanation for the alleged detrimental effect of peri-traumatic dissociation on long-term memory functioning may be derived from Roediger (1990). Experiences that are element of an encompassing class of familiar events are predominantly processed top-down or conceptually-driven. Unexpected and unfamiliar experiences, for which no schema’s are present, are initially processed in a relatively bottom-up, data-driven way. Given that trauma’s tend to run counter to the ‘world views’ held by the victim (e.g. Janoff-Bulman & Frantz, 1997), one may speculate that the traumatic event is initially processed in a mainly data-driven and non-conceptual way. And extreme data-driven processing may subjectively be experienced as dissociation. The processing style at encoding determines the quality of the memory representations at recall (Roediger, 1990). As a result, the memory of the traumatic event in victims who dissociated during and after the trauma may be supposed to consist primarily of fragmentary, loosely interrelated perceptual features like visual images (‘film clips’), sounds, smells, and somatosensory sensations without a coherent structure (e.g. van der Kolk & Fisler, 1995; but see also Noyes, Hoenk, Kuperman, & Slymen, 1977). In other words, dissociation during and after the trauma may be associated with poor conceptual processing and extreme data-driven processing of traumatic events, resulting in fragmentary memory.

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