



Reduced intrusion development after post-trauma imagery rescripting; an experimental study

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ABSTRACT

Background and objectives: Contemporary theories predict PTSD development after trauma if trauma information is not adequately processed or negatively appraised. Mental imagery and emotional processing seem to be strongly related and evidence-based treatment strategies such as imaginal exposure and EMDR indeed include imagery as a main component. Moreover, imagery rescripting of traumatic memories is an effective treatment for PTSD.

Methods: The present study combined these lines of research and investigated the impact of early imagery rescripting on intrusion development after an aversive film. Seventy-six participants were randomly allocated to one of three conditions: imagery rescripting (IRS), imagery reexperiencing (IRE) and positive imagery (PI). All participants watched an aversive film, had a 30-min break and then received a 9-min intervention (IRS, IRE or PI). They indicated subjective distress during the intervention, recorded intrusive memories of the film for 1 week and completed the Posttraumatic Cognitions Inventory (PTCI) and a cued recall test one week later.

Results: The IRS group developed fewer intrusive memories relative to the IRE and PI groups, and less negative cognitions than the IRE group, while cued recall was enhanced in IRS and IRE groups compared to the PI group. IRS and PI groups experienced less distress during the intervention than the IRE group.

Limitations: This is an analogue design and results should be replicated in clinical samples.

Conclusions: The results suggest that IRS might be an adequate technique to change memory consolidation at an early stage and therefore a powerful and non-distressing strategy to prevent PTSD symptoms.

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1. Introduction

Contemporary theories posit that at least part of the reason for someone to develop posttraumatic stress disorder (PTSD) after trauma lies in the fact that information is not adequately processed during and after trauma (Brewin, 2001; Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000). In other words, early information processing (i.e., encoding of trauma information) and the formation of an “inadequate trauma memory” (or “fear structure”; Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989) play a key role in the development of vivid reexperiences. Experimental studies indeed showed that factors affecting the encoding of trauma-related information, such as tonic immobility (Hagenaars, Van Minnen, Holmes, Brewin, & Hoogduin, 2008), visuospatial tasks

(Holmes, Brewin, & Hennessy, 2004), or dissociation (Kindt, Van den Hout, & Buck, 2005) affected the development of intrusions. Moreover, clinical studies also found some of these peritraumatic factors, like tonic immobility (Heidt, Marx, & Forsyth, 2005) and dissociation (Ehlers, Mayou, & Bryant, 1998) to be related to subsequent PTSD development.

Treatments may be seen as reversing this process. That is, treatments that focus on changing the PTSD trauma memory structure prove successful in reducing PTSD symptoms, as is the case in imaginal exposure and EMDR treatments (e.g., Bradley, Green, Russ, Dutra, & Westen, 2005). Recently, a new technique called imagery rescripting was introduced. When combined with imaginal exposure, imagery rescripting proved as effective as imaginal exposure alone in changing PTSD symptoms, with fewer patients dropping out of treatment. Moreover, relative to pure imaginal exposure, patients also showed a greater decrease in anger, guilt and shame if imagery rescripting was added (Arntz, Tiesema, & Kindt, 2007). Imagery rescripting was also effective as treatment for snake phobia (Hunt & Fenton, 2007), intrusive

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memories in depression (Brewin et al., 2009), and personality disorders (Weertman & Arntz, 2007).

In imagery rescripting, participants imagine different responses to and outcomes of the original event and its aftermath. A new script might include somebody else entering the scene and bringing safety, or the participant being in power and preventing the trauma, or taking revenge on perpetrators. Part of its effects might be explained by the healthy effects of expressing inhibited responses, and part by the adaptive effects of the change of meaning of the original event (Arntz, 2011; Arntz & Weertman, 1999; Arntz et al., 2007). In classical conditioning terms, imagery rescripting changes the UCS-UCR representation in memory by imagining more functional responses and outcomes to the original event. This so-called UCS/UCR revaluation changes the meaning of the fear memory underlying trauma-related symptoms (Arntz, 2011; Davey, 1989). By using imagery, the meaning change not only takes place on a verbal cognitive level, but also on sensory, emotional and behavioural levels.

By affecting imagery-based processing directly, imagery rescripting may not only serve treatment goals, but could also be an adequate tool in preventing the trauma-related, intrusive images from developing in the first place. There is some research suggesting the powerful effect of imagery on future behaviour and affect. For example, the ease of imagining the symptoms of a disease was associated with subsequent likelihood ratings of contracting that disease (Sherman, Cialdini, Schwartzman, & Reynolds, 1985). Interesting, similar findings were found with respect to positive affect. That is, participants imagining positive events reported greater increases in positive affect than participants thinking about the verbal meaning of that event. The former group also rated new descriptions as more positive than the latter (Holmes, Mathews, Dalgleish, & Mackintosh, 2006). Imagery can also alter judgements about past events (e.g., Garry, Manning, Loftus, & Sherman, 1996), again suggesting the relevance with respect to trauma and PTSD prevention.

Thus far, early post-trauma PTSD prevention strategies, like psychological debriefing, are often ineffective or even harmful (Wessely & Deahl, 2003). Early intervention may be a better strategy, although results with a brief cognitive therapy for persons with acute PTSD were not very promising in preventing chronic PTSD (Sijbrandij et al., 2007). Cognitive behavioural strategies were effective in acute stress disorder (e.g., Bryant, Moulds, Guthrie, & Nixon, 2003; Bryant, Moulds, Guthrie, & Nixon, 2005), but acute stress disorder is not necessarily predictive of PTSD (Bryant, Creamer, O'Donnell, Silove, & McFarlane, 2008). The early interventions that have been investigated thus far mainly focus on exposure to traumatic memories and/or cognitive restructuring. Imagery rescripting may be a fruitful alternative. Besides the strong association between imagery and affective processing (Hagensaars, Brewin, Van Minnen, Holmes, & Hoogduin, 2010), the rescripting part may lead to altered encoding and consolidation of trauma information (e.g., feelings of mastery associated with the new script become linked to the trauma information). This may result in the development of other sorts of memories in the first place and therefore lead to more positive affect and (trauma-related) cognitions. In the present study manipulations were done 30 min after analogue trauma for this reason. That is, memory consolidation is still in progress at that point (Dudai, 2004), meaning that the memory is still labile and sensitive to change. Also, practically, as our manipulations were new, we wanted to keep their timing in accordance with previous experimental studies that found effects of manipulations conducted 30 min post-stressor on the development of intrusive memories (Holmes, James, Coode-Bate, & Deeprouse, 2009; Holmes, James, Kilford, & Deeprouse, 2010).

The present study explores whether imagery rescripting affects intrusion development using an experimental trauma film paradigm. Participants were randomized over three post-film conditions: imagery rescripting (IRS), imagery reexperiencing (IRE) and positive imagery (PI). IRE and PI were used as control conditions in order to control for the effects of imagery (both IRE and PI), the effects of re-activating the memory of the film (IRE), and the effect of positive imagery and positive mood (PI). First, IRS participants were expected to report less distress during the intervention than IRE participants, because they had to concentrate on a positive outcome after retrieving the memory of the aversive film. In addition, it was hypothesized that the IRS condition would be associated with fewer intrusive memories of the film and less negative cognitions compared to the other experimental groups. Because IRS and IRE both involved active reprocessing of film material, and PI did not, we expected that IRS and IRE groups would both have enhanced explicit memory of the movie compared to PI. With both IRS and IRE showing enhanced explicit memory, differences between these conditions on intrusions and negative cognitions would not be related to explicit memory.

2. Method

2.1. Participants

Eighty-three students were recruited at Leiden University campus and completed the screening phase. Seven participants were excluded because they experienced road traffic accidents ($n = 3$), or suffered from a mood or anxiety disorder ($n = 4$), leaving a total sample of 76 participants (29 males). Age ranged from 18 to 38 ($M = 21.4$ years, $SD = 4.0$). All participants gave written informed consent and received course credits or cash money for their participation.

2.2. Material

A 10-min film was used to model a traumatic experience. The film consisted of four traumatic scenes of real-life footage of the horrible aftermath of road traffic accidents, such as dead bodies being moved, injured victims, and car wrecks. Following Hagensaars et al. (2008), one scene was removed from the original 5 scenes compiled by Steil (1996).

2.3. Measures

2.3.1. Psychiatric symptoms

The 12 screening items of the Structured Clinical Interview for DSM-IV (SCID-I; Spitzer, Williams, Gibbon, & First, 1992) were used to assess psychiatric symptoms. The SCID-I is a standardised, semi structured, diagnostic interview for diagnosing DSM-IV psychiatric disorders, which has good reliability (overall kappas were .61 for current and .68 for lifetime diagnosis). Diagnoses were checked using the relevant SCID-I sections if participants endorsed symptoms on one of the items.

2.3.2. Mood ratings

Participants indicated how anxious, horrified, sad and angry they felt before and after watching the film and before and after the interventions on a scale from 0 ("not at all") to 10 ("extremely"), to check the emotional impact of the film and the interventions.

2.3.3. Distress

Participants rated the amount of distress they felt on a scale from 0 (no distress) to 10 (extreme distress) before the 9-min intervention, and every 3 min after it had started, resulting in 4 SUD scores per person.

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