

## Induced Trauma, Real Emotions: Call for a New Paradigm

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### Opinion

Nasty things stick to you like glue. This seems to be especially true for traumatic experiences. It is highly common to experience post-traumatic symptoms as intrusions, avoidance and negative alterations in mood and arousal associated with the traumatic event in the initial aftermath of a traumatic experience. A minority of these victims shows persistent symptoms and develops post-traumatic stress disorder [1]. This also implies that the majority of victims does not develop PTSD. This raises the question, why does a traumatic experience really stick like glue in some persons, but not in others?

Several studies have addressed this question. Risk and vulnerability factors have been retrospectively linked to the development and maintenance of PTSD [1,2]; also pretraumatic risk factors have been associated with PTSD symptoms [3]. Though highly important and informative, the traumas in these studies do vary on several aspects such as type of traumatic experience, duration and frequency of the trauma and time between trauma and assessment. These factors can influence the severity and characteristics of the PTSD symptoms. Additionally, PTSD patients do report that it is hard to accurately describe past emotional states or events.

To control for differences in trauma aspects, experimental studies are necessary. These types of studies can help providing more insight in the risk factors, development and maintenance of PTSD. However, it is clearly unethical to subject persons to real traumatic events to induce PTSD symptoms. Therefore, analogue designs are often used to get more insight in PTSD symptoms. The most frequently used paradigm is the trauma film paradigm [4-7]. In this paradigm stress-evoking film fragments are presented, the fragments can be realistic, such as car accidents, or fictitious, for example a violent raping scene. Presenting these film fragments can result in temporary PTSD symptoms like negative mood, distress, dissociation and involuntary flashbacks or intrusions of the film content [5]. Additionally, risk factors associated with PTSD are also linked to PTSD symptoms evoked by the film paradigm [8]. In sum, the trauma film paradigm is a reliable and valuable analogue for inducing and assessing PTSD.

### Useful but...

Even though the film paradigm has proven its value, it also has its shortcomings. First, there is still debate as to whether PTSD symptoms can be evoked via television [9]. The "victim" is not directly experiencing or witnessing the traumatic event(s), neither is a close family member or friend involved [10]. Second, the frequency of reported intrusions induced by a film is rather low; the average number of intrusions in the days following the stressful film ranges from 1.6 (traffic accidents) [11] to 5.92 (rape scene) [7]. This is not necessarily problematic as not the number of intrusions, but the amount of distress caused by the intrusion, their "here and now" quality, and lack of embedded context are thought to predict the severity of PTSD [12]. However, intrusions evoked by a film are rated as moderately vivid [7] and seem to cause little distress [11]. A final shortcoming is that using a film paradigm hinders testing one of the core symptoms of PTSD, namely avoidance of trauma-related material [11]. In a recent study, we used one of the most stressful films (*Salò o le 120 giornate di Sodoma*), resulting in an

average of 5.0 intrusions in the week following the film. Additionally, these intrusive memory only caused mild arousal, were moderately vivid, and perceived as highly controllable (control group without intervention) [5]. Interviews at follow-up revealed that participants were aware that it was "only" a film with actors and actresses, hindering the feeling of being a close witness at the scene.

### Solution?

A promising technology to extend the trauma film paradigm is virtual reality (VR). The technique has already been successfully applied in treating combat-related PTSD [13,14] and other psychological disorders [15]. The huge advantage of VR over film presentation is that the former method induces higher levels of immersion [16] and more intense emotions [17] compared to the latter. Furthermore, VR easily allows examining one of the core symptoms of PTSD, avoidance of trauma-related material. As such this technique seems to be highly suitable for inducing PTSD symptoms and to assess the development, maintenance and treatment of these symptoms.

### Help!

At our lab we are developing a novel analogue for trauma experiences using VR [16]. Though this seems like a next logical step, we do experience difficulties. The good news is that VR indeed results in high levels of immersion and the participants do report intrusions after trauma induction. However, the VR scene does not strongly affect the participants and the self-reported amount of intrusions and their vividness remains low, whereas their controllability stays high. These are issues that need to be addressed in order to bring this paradigm to the next level. Perhaps several research groups are developing and testing novel trauma analogues or maybe the trauma film paradigm is the most effective way to induce PTSD symptoms. I urgently appeal to researchers who are busy with the same questions to bundle our strengths and create a trauma analogue that can help providing more insight in PTSD its risk factors and possibilities for treatment. Let's see if we can temporarily glue some PTSD symptoms to an aversive event.

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