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Inducing and modulating intrusive emotional memories: A review of the trauma film paradigm

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Abstract

Highly affect-laden memory intrusions are a feature of several psychological disorders with intrusive images of trauma especially associated with post-traumatic stress disorder (PTSD). The trauma film paradigm provides a prospective experimental tool for investigating analogue peri-traumatic cognitive mechanisms underlying intrusion development. We review several historical papers and some more recent key studies that have used the trauma film paradigm. A heuristic diagram is presented, designed to simplify predictions about analogue peri-traumatic processing and intrusion development, which can also be related to the processing elements of recent cognitive models of PTSD. Results show intrusions can be induced in the laboratory and their frequency amplified/attenuated in line with predictions. Successful manipulations include competing task type (visuospatial vs. verbal) and use of a cognitive coping strategy. Studies show that spontaneous peri-traumatic dissociation also affects intrusion frequency although attempts to manipulate dissociation have failed. It is hoped that further use of this paradigm may lead to prophylactic training for at risk groups and an improved understanding of intrusions across psychopathologies.

PsycINFO classification: 2340

Keywords: Intrusive memories; Trauma film; Post-traumatic stress disorder; Peri-traumatic processing; Imagery; Cognitive mechanisms; Stressful film; Visuospatial

1. Introduction

Intrusive memories, or intrusions, are involuntary recollections relating to events that appear, apparently spontaneously, in consciousness (e.g. Brewin & Saunders, 2001; Davies & Clark, 1998b; Halligan, Clark, & Ehlers, 2002; Holmes, Brewin, & Hennessy, 2004; Schlagman, Kvavilashvili, & Schulz, 2007). Intrusions can be contrasted with the deliberate recollection of events or repeated verbal rumination over such events. Whilst intrusions can take the form of either sensory mental images or verbal thoughts our main interest is to understand mental imagery based intrusions (i.e. those which have a sensory component such as mental picture or sounds). This focus mirrors both clinical phenomenology and also healthy autobiographical memories for emotional events. Several studies have suggested that emotional memories typically take the form of mental images irrespective of whether such memories are intrusive or deliberately recalled (Arntz, de Groot, & Kindt, 2005; Conway, 2001) and, conversely, imagery seems to have a special impact on emotion (Holmes & Mathews, 2005).

Intrusive memories occur often in everyday life with studies in non-clinical populations suggesting that their frequency is approximately 2–4 a day (Berntsen, 1996) or 1–5 a day (Mace, 2005), although they occur less frequently than verbal thoughts (Brewin, Christodoulides & Hutchinson, 1996). However, these common, unsolicited recollections typically present no concern for the experiencer and can give rise to positive as well as negative affect. In

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contrast, the vivid re-experiencing of excerpts from a traumatic event can be extremely distressing and form one of the three key symptoms for diagnosis of post-traumatic distress disorder (PTSD; American Psychological Association [APA], 1994). There is also considerable evidence implicating intrusive image-based memories in psychological disorders other than PTSD such as: social phobia (Hackmann, Clark, & McManus, 2000; Hirsch, Clark, Mathews, & Williams, 2003); depression (Kuyken & Brewin, 1994, 1999; Reynolds & Brewin, 1999); psychosis (Morrison et al., 2002); agoraphobia (Day, Holmes, & Hackmann, 2004); and cravings in substance misuse (Kavanagh, Andrade, & May, 2005). See Holmes and Hackmann (2004) for further examples. Steel, Fowler, and Holmes (2005) suggested that similar cognitive information-processing mechanisms may be involved in the creation of intrusive memories irrespective of disorder. Psychopathological intrusions can be viewed as an extension of a continuum from our common, everyday intrusions (see Holmes, 2004).

The factors that determine whether a memory becomes intrusive need to be understood. The clinical literature indicates that peri-traumatic factors (i.e. processes during encoding of trauma), such as dissociation, are the best predictors of later PTSD symptoms compared to other factors such as demographics or trauma type (see the meta-analysis by Ozer, Best, Lipsey, & Weiss, 2003). However, as argued by Candel and Merckelbach (2004) a limitation of many "peri-traumatic" clinical studies is heavy reliance on retrospective reports of reactions during trauma. Such methodology has important limitations since people in general, and PTSD patients in particular, find it difficult to give accurate descriptions of past emotional states. Prospective designs are therefore warranted, however it is clearly unethical to deliberately expose research participants to real trauma. To circumvent this, some studies have adopted ingenious paradigms such as testing trainee firefighters prior to their exposure to a real fire (Bryant & Guthrie, 2005), or using analogues of high anxiety situations such as volunteer sky divers (Sterlini & Bryant, 2002). Another analogue approach, the trauma film paradigm, offering laboratory control, has emerged in the quest for prospective methodologies.

The trauma film paradigm involves showing non-clinical participants short films which contain scenes depicting stressful or traumatic events. In this context, a traumatic event is defined as actual or threatened death or serious injury to the body or self (APA, 1994). Strictly speaking, these films might best be referred to as "films with traumatic content" since they do not necessarily induce an "intense emotional reaction" as required by the diagnostic criteria for trauma. However, for brevity we use the term "trauma films".

1.1. Historical perspective

The use of the trauma film paradigm was pioneered by Lazarus and colleagues in the 1960s (e.g. Lazarus & Alfert, 1964; Lazarus & Opton, 1964; Lazarus, Opton, Nomikos, & Rankin, 1965; Speisman, Lazarus, Mordkoff, & Davison, 1964). These predominantly focussed on physiological stress responses (heart rate and skin conductance) produced by viewing the film and clearly demonstrated that marked stress responses were inducible in the laboratory by a variety of film stimuli. More crucially, these studies also showed that stress response severity could be experimentally altered by various manipulations such as: prior "cognitive orientation", i.e. perceiving events as fictional or being emotionally detached from events (Lazarus et al., 1965); assuming an involved or detached viewing stance (Koriat, Melkman, Averill, & Lazarus, 1972); or by utilising relaxation, desensitisation, and cognitive rehearsal techniques (Folkins, Lawson, Opton, & Lazarus, 1968).

A psychophysiological finding of Folkins et al. (1968) seems particularly intriguing. Relative to a control condition, use of either relaxation or cognitive rehearsal (desensitisation without the relaxation component) during the film reduced self-reported anxiety scores and skin conductance. However, such manipulations did not reduce heart rate response during film viewing as hypothesised by a traditional 'fight or flight' arousal response to stress. As the authors note, a closer inspection of the data suggests that the lack of a significant group difference in heart rate may be due to heart rate reductions in the control group immediately around the traumatic scenes contained in the film. A finding of reduced heart rate, or bradycardia, coincident with peaks in trauma content is also found in Holmes et al. (2004), see Section 3.2.

The trauma film paradigm was further developed by Horowitz and colleagues in the 1970s (e.g. Horowitz, 1969, 1975; Horowitz & Becker, 1971a, 1971b, 1971c, 1973; Horowitz, Becker, Moskowitz, & Rashid, 1972; Horowitz & Wildner, 1976). A major development was to consider the impact of films (with content depicting blood and injury, bereavement and separation, or erotic scenes) on the frequency of intrusive thoughts generated. Typically intrusive thoughts were measured over short periods (within 5-min of the film ending) rather than the week-long diary methods typically used today (see Section 2). This considerable body of work (for a review see Horowitz, 1975) systematically considered how intrusion frequency was affected by variables such as: nature of stimuli (film type and film repetition); sample populations (including psychiatric patients and servicemen with prior exposure to trauma); and cognitive processing instructions (to vary use of imagery, attention, or modify interpretation of the meaning of intrusions). In summary, Horowitz (1975) suggested that the tendency to experience intrusive memories following a stressful event was a general one, present in the population at large and expected to occur following mild as well as severe stress events.

Butler, Wells, and Dewick (1995) extended the paradigm by monitoring film-related intrusions for a week after film viewing. They also provided verbal instructions requesting