



Trauma memory characteristics and the development of acute stress disorder and post-traumatic stress disorder in youth



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ARTICLE INFO

Article history:

Received 21 August 2015

Received in revised form

26 February 2016

Accepted 19 July 2016

Available online 22 July 2016

Keywords:

Post-traumatic stress

Trauma memory

Children

Acute stress

ABSTRACT

Background & objectives: The present study addresses gaps in knowledge regarding the association between trauma memory processes and posttraumatic stress responses in youth. Our primary goal was to explore the relative contribution of perceptions of trauma memory quality versus narrative trauma memory characteristics to explain overall adjustment.

Methods: Children ($N = 67$) were interviewed within four weeks (T1) of an injury leading to hospital treatment and then again eight weeks later (T2). In each interview, the child told a trauma narrative (which were later coded), and answered the Trauma Memory Quality Questionnaire (Meiser-Stedman, Smith, Yule, & Dalgleish, 2007a), a self-report measure indexing the sensory, fragmented, and disorganised characteristics of trauma memory. They then completed measures of Acute Stress Disorder (ASD) symptoms and associated psychopathology at T1 and measures of Posttraumatic Stress (PTS) symptoms and associated psychopathology at T2.

Results: Self-reported trauma memory characteristics predicted ASD symptoms cross-sectionally at T1 and PTS symptoms prospectively over time. At both time points, self-reported trauma memory characteristics accounted for all of the unique variance in symptoms initially explained by narrative characteristics. A reduction in self-report ratings, but not the hypothesised narrative features (e.g., disorganised or lexical elements of the narrative), significantly predicted a reduction in PTS symptoms over time.

Limitations: The small sample size and the absence of a within-subjects narrative control were the main limitations of the study.

Conclusions: These findings underscore the importance of self-reported trauma memory characteristics to the aetiology of PTSD.

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1. Introduction

Several aspects of trauma memory have been implicated in the aetiology of PTSD across the life span (Brewin, Gregory, Lipton, & Burgess, 2010). However, these aspects of trauma memory have generally been less widely studied in child and adolescent samples. Understanding the relative contributions of aspects of trauma memory to overall adjustment in youth has the potential to provide important information about the profile of traumatic stress

responses in youth.

Current theoretical conceptualisations of PTSD argue that characteristics of autobiographical trauma memories are central to the pathology of the disorder (Brewin, 2001; Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000). Before treatment, the PTSD sufferer's *intentional* autobiographical memory of the trauma is dominated by sensory/perceptual features, emotional elements, and their memories are thought to be more fragmented/disorganised and incomplete relative to memories of other sorts of experiences (Brewin, 2001; Brewin et al., 1996). This is caused by a combination of the adoption of suboptimal cognitive processes while encoding the trauma (Ehlers, Hackman, Ruths, & Clark, 2007), and a cascade of further unhelpful cognitive (e.g., appraisals) and behavioural symptoms (e.g., management strategies) afterwards (Halligan, Michael, Clark, & Ehlers, 2003). One

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important consequence of these poorly formed *intentional* memories is that the person is more vulnerable to recalling the trauma *involuntarily* (i.e., intrusively) (Brewin et al., 2010; Ehlers, Hackman, & Michael, 2004).

The structure of autobiographical trauma narratives are argued to be altered in the context of PTSD, with the emotional processing of trauma memories an important treatment component outlined by cognitive theories (Clark & Ehlers, 2004). In their seminal investigation, Foa, Molnar, and Cashman (1995) coded the verbal trauma narratives of adults before and after therapy to assess the nature of their voluntary memory retrieval. The main finding was that the adults that had recovered included a significantly higher percentage of thoughts reflective of attempts to organise the trauma memory (as compared to before treatment). In the past thirty years, the technique of using narratives to assess the nature of trauma memories has been replicated many times in adults (for review see O'Kearney & Perrott, 2006). Despite widespread examination, few qualitative markers have emerged as consistent predictors of the disorder (Jelinek et al., 2010; Halligan et al., 2003; Hellawell & Brewin, 2004; Jelinek et al., 2010; Jones, Harvey, & Brewin, 2007; Moulds & Bryant, 2005; Murray, Ehlers, & Mayou, 2002; Tromp, Koss, Figueredo, & Tharan, 1995; van Minnen, Wessel, Dijkstra, & Roelofs, 2002; Zoellner, Alvarez-Conrad, & Foa, 2002). Two reasons for this are (a) that a variety of coding schemes have been used to measure the organisation and lexical content of trauma narratives, and, (b) there is vast heterogeneity with respect to samples and study designs.

Narrative techniques have seldom been used to explore the links of trauma memory and PTSD in children and young people. It is necessary to consider the most appropriate scheme to use with children at the outset. The Foa et al. (1995) scheme has some strengths and is widely considered the coding scheme of choice when applied to adults. Nevertheless, this may not be the best scheme for children. In their scheme, repetition is considered the most important index of fragmentation within its coding hierarchy.² We feel this priority is problematic as children often use repetition as a point of emphasis during discourse (O'Kearney & Perrott, 2006; O'Kearney, Speyer, & Kenardy, 2007). O'Kearney et al. (2007) introduced a scheme specifically for children. This scheme is summarised in Table 1. The key difference between this scheme and previously used coding schemes (e.g., Foa et al., 1995) is the assessment of the narrative's level of fragmentation and temporal disorganisation using established child psycholinguistic principles for assessing *coherence* and *cohesion*. The underlying premise of cohesion/coherence theory is that a narrative can be conceived of as organised on multiple levels. Coherence is defined as the assessment of organisation in terms of a narrative's macro-structure (Peterson & McCabe, 1983, 1991). It is operationalised by an assessment of the narrative's sequencing, its context (i.e., person, place and time), the overall structure of the narrative (e.g., does it have a beginning, middle and ending), and the extent to which the narrative is evaluative. Cohesion is defined as the organisation of the narrative's micro-structure. The use of various connective devices is assessed to determine the meaning or organisation of clauses (Halliday & Hasan, 1996). Connective devices assessed within the O'Kearney et al. (2007) scheme include *causal* markers (*because*, *so*), comparative markers (e.g., *but*), and temporal markers (e.g., *then*). To illustrate how connective devices aid understanding, consider when the term '*then*' is added to the

sentence "We went to the coffee shop and the clothes store and the park". The sentence would now read "We went to the coffee shop *and then* to the clothes store *and then* to the park". In the present study, we followed the scheme of O'Kearney et al. (2007) as in our view this scheme stands out from the others because it is consistent with well-established psycholinguistic principles adopted for coding aspects of discourse in children.

There are currently three cross-sectional studies that have explored the relation of narrative trauma memory to PTSD in youth. Supporting cognitive models, in a sample of acutely injured children higher levels of temporal disorganisation predicted parent report of the child's overall adjustment to their PTSD symptoms (although these were largely in the sub-syndromal range) (Kenardy et al., 2007). However, the use of a very simple coding scheme and a parent reported measure of PTSD were serious limitations. O'Kearney et al. (2007) also studied the relationship of linguistic devices to sub-clusters of PTSD in a sample of acutely injured children using their specially developed coding scheme. Children experiencing intrusions told trauma narratives with fewer sensory/perceptual words (e.g., the car was *black*), fewer references to impaired encoding/retrieval (e.g., "I can't remember"), and the use of lexical markers associated with meaning making (e.g., use of words like *because* and *so*).

Although narrative qualities provide important insights, each of the above studies is limited in that several different aspects of trauma memory are argued to be impaired in the context of PTSD, and therefore it is necessary to test the relative contributions of these aspects to overall adjustment. One pertinent aspect of trauma memory previously shown to be important in children with PTSD is the perception of trauma memory quality. It is important to note that perceptions of trauma memory quality (often indexed by measures such as the Trauma Memory Quality Questionnaire (TMQQ; Meiser-Stedman, Smith, Yule, & Dalgleish, 2007) are essentially *meta-memory perceptions*. These perceptions can be influenced by a number of factors other than the strength of the individual's memory (Roebers & Schneider, 2001). Hence, whilst it is likely that perceived memory quality and narrative memory structure are related, they are distinct constructs, with the qualitative coding of memories arguably a slightly more objective way of obtaining information than asking someone to rate a questionnaire. The Ehlers and Clark (2000) model is unclear as to the importance of trauma narratives relative to perceptions of memory quality in driving adjustment. However, as the model argues it is the individual's perception of their memory that drives their coping responses, it is plausible that perceptions of trauma memory quality would hold the stronger association. Inconsistent with this, the one study addressing these questions in youth (i.e., Salmond et al., 2011) showed that narrative disorganisation (coded according to the Foa et al. (1995) scheme) predicted ASD severity, but self-reported trauma memory characteristics did not contribute to symptom severity over and above narrative aspects.

In summary, studies have produced mixed results for the association of narrative memory processes to PTSD in children. The adoption of cross-sectional designs has also precluded a thorough investigation of the *causal* role of trauma memory features to PTSD development and *recovery*. Finally, with the exception of Salmond et al. (2011), the relative importance of narrative features and perceptions of trauma memory quality has not been widely studied.

Given this, the primary aim of the present study was to investigate the *relative* contribution of perceptions of trauma memory quality and trauma narrative memory variables to overall adjustment. We recruited a cohort of children and adolescents aged 7–16 years who were either admitted to hospital or attended the emergency department (ED) following a traumatic injury. The relationships of trauma memory characteristics to PTSD were

² The Foa et al. (1995) coding scheme states that when utterances of speech are determined as fitting two categories (e.g., emotions and repetitions), then the coder should choose the linguistic feature that is at the top of the hierarchy. Repetitions are listed at the top of this coding hierarchy.

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