Comparing Children’s Memories for Negative Versus Positive Events in the Context of Posttraumatic Stress Symptoms

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How well children remember negative events is not fully understood. Previous research has failed to simultaneously test memory and perceptions of memory for both negative and positive events. Children ($n = 38$, 7–17 years) recruited from a hospital following accidental injury were tested for their memory of an injury-producing accident (negative event) and a positive event (unexpectedly receiving a $50 gift voucher). Objective accuracy of memory, memory quality characteristics (e.g., how coherently the event was recalled), children’s judgments of their memory (meta-cognitive), and posttraumatic stress (PTS) symptoms were assessed 2 months post-injury. Children’s memories for their experiences were verified using witness/parent reports. Memory quality characteristics of children’s free recollection were coded with a previously used standardized system. Overall, children showed high levels of accuracy for both events, with little degradation over time. High PTS children showed little evidence of deficits in coherence or organization in their narratives relative to low PTS children. Although in some instances high PTS children judged their memory quality to be poor compared to low PTS children, this depended on how this was assessed (e.g., self-report questionnaire vs. coded narratives). In terms of limitations, it is unclear whether the findings will generalize for memories of repeated events. Witness verification of the accident details itself could be prone to error. In conclusion, the findings are broadly supportive of the proposal made by theorists who argue that trauma memories are recalled no less accurately than other distinctive memories. The role of meta-cognitive elements of children’s memory and reporting in PTS is less clear.

Keywords: PTSD; children; memory; accuracy; meta-cognition

Despite extensive research into how memories of trauma are encoded and retrieved (voluntarily and involuntarily), there remain significant gaps in our understanding of these phenomena. The bulk of this research has been conducted in the context of posttraumatic stress disorder (PTSD). However, we know far less about memory after recent trauma (e.g., in acute stress disorder, ASD). This is particularly the case with children’s recollections. There remains mixed evidence as to whether memory is impaired or enhanced by traumatic experiences. Research to date has failed to consistently delineate differences between accuracy of one’s memory and judgments of one’s memorial experience (meta-cognitive aspects). There is also still some debate as to whether memory differs depending on the valence of the event (e.g., negative and positive). These issues are now reviewed.
One perspective of traumatic memory is one we label the “fragmented memory” model. It is argued that sufferers of PTSD show impaired recollection during voluntary recall, characterized by disorganization and lack of coherence in the trauma narrative (e.g., placing aspects of the event out of order, little context such as time markers provided), omissions, and an emphasis on sensory experiences at the expense of a coherent, conceptual narrative that communicates an understandable story associated with a sense of understanding and logical flow (Brewin, Dalgleish, & Joseph, 1996; Ehlers & Clark, 2000). In contrast, in what we refer to as the “distinctive” model, memory for important events that are novel or stand out is thought to be recalled reasonably well, irrespective of valence of the event. This view in part draws on Brown and Kulik’s (1977) concept that traumatic experiences are surprising and consequential, resulting in “flashbulb memories.” Accordingly it has been argued, predominantly in the adult field, that traumatic events are recalled not because they are traumatic per se, but because they are unique and extraordinary events that are personally relevant (Howe, 1997, 1998; Hudson, 1990; see also McNally, 2003; Rubin, Berntsen, & Bohni, 2008). Extending this view, it is possible in some circumstances that individuals exposed to trauma might actually recall the traumatic event or elements of the event better than other experiences in terms of providing a clearly defined account with sensory details and emotional information (Fivush, 1998; Megias et al., 2007; Porter & Brit, 2001; Shobe & Kihlstrom, 1997). In children there has been little direct testing of the varying accounts of traumatic memory, nor simultaneous assessment of negative and positive events. An additional issue that requires emphasis is the distinction between accuracy and meta-cognitive judgments of memory quality. Although memory recall is generally reconstructive, researchers are not always explicit as to whether the “memory” under study is being defined as an objectively measured representation of accuracy for the event or whether the individual reports actually reflects their perception of their memory or its quality (i.e., meta-memorial aspects). Such a variation in focus might account for some of the discrepancies observed in the field to date. In reviewing the relevant literature, we recognize that there are developmental differences in memory abilities as children age. However, although improvements in declarative memory and awareness of memory performance occur during the school years, children at the younger age range still have insight in relation to their memory, that is, meta-cognitive awareness (Schneider, 2004) and children and adolescents are capable of reporting autobiographical experiences in detail (Hitchcock et al., 2014).

When it comes to studies that have indexed more meta-cognitive aspects of memory through questionnaires or coding of narratives, it appears that children with higher PTS symptoms early after trauma report memories that are high in sensory detail and associated with confusion as to aspects of the event ($r = .67$, CI$_{95}$ [.51, .78]; $r = .48$ [.18, .70], McKinnon et al., 2016 [Study 1]; $r = .47$, CI$_{95}$ [.26, .64], McKinnon et al., 2017; $r = .76$, CI$_{95}$ [.64, .84], McKinnon et al., 2008; $r = .78$, CI$_{95}$ [.68, .85], Meiser-Stedman, Smith, Yule, & Dalgleish, 2007). Coding of children’s trauma narratives has indicated higher levels of disorganization in high PTS children relative to their low symptom counterparts ($d = 0.53, [0.04, 1.12]$, Salmond et al., 2011) and that difficulties placing events in temporal order were associated with greater PTS 1-month and 2–3 months posttrauma respectively ($r = .36, [.53, .13]$, $r = -.30, [.50, -.06]$, McKinnon et al., 2017). To a degree, these findings lend support to a fragmented memory account for trauma.

However, what happens when accuracy of memory is examined? In short, with some exceptions, it appears that traumatized children can be very accurate in their recollections, with accuracy not strongly related to PTS (note, however, that when accuracy is relatively and uniformly high, it will be less likely that strong relationships with PTS can be detected). For example, a high level of accuracy for a medical procedure was observed when children were tested 1 week later, with accuracy verified against a video of the procedure (88.19%, [85.52, 90.86]; McKinnon et al., 2016, Study 1). Accuracy was only weakly correlated with symptoms and associated with a large CI, $r = .17 [-.17, .47]$. Using similar methods and examining children’s memory of an accidental injury (verified against adult witness reports), accuracy was again high 4- and 8-weeks postinjury ($r = .53, [.04, 1.12]$, Salmond et al., 2011) and accuracy was again high 12-months postinjury ($r = .50, [.25, .73]$, Salmond et al., 2013).

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Although it is unusual to report so much statistical detail in the Introduction, we report effect sizes and confidence intervals as they speak to both the magnitude and variability of effects and we argue this is more informative than whether a finding was simply significant or not (see Cumming, 2008, 2014, for discussion of the advantages of effect sizes and CIs over $p$ values). Unless otherwise stated, CIs are reported throughout as 95% intervals.

2 Unbiased $d$s were calculated using Cumming’s (2012) Explanatory Software for Confidence Intervals (ESCI). They were calculated based on data reported within the article in question. Unless otherwise specified, the reported $d$s take into account Hedges’ (1981) adjustment that is recommended for small sample sizes.
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