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## DEBATE

# The weight of evidence regarding the nature of traumatic memories: A comment on Mazzoni et al.

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The ongoing debate about the nature of traumatic memories has engaged numerous scholars, each providing evidence either for or against special properties that distinguish such memories from other emotional memories. Mazzoni et al. (2025) offered a balanced and comprehensive perspective concerning the topic of traumatic memories. On the one hand, they pointed out that numerous clinical observations, and supposedly the results of some neurobiological studies, have shown that traumatic memories often lack verbal content and are accompanied by intense bodily sensations, making them special in this regard (Brewin, 2016; Solms, 2018; Van der Kolk, 1998). These observations have led to interpretations of these findings as representing dissociative amnesia or repressed memories. On the other hand, researchers (McNally, 2007; Merckelbach & Patihis, 2018) have contended that scientific data do not consistently support the special nature of traumatic memories or the frequent occurrence of amnesia for a given event (Mangiulli et al., 2022; McNally, 2003; Otgaar et al., 2019). Instead, the lack of clear evidence supporting dissociation from (or repression of) traumatic memories contrasts with substantial data suggesting that negative and stressful experiences enhance, rather than impair, memory (Shields et al., 2017). Even if differences in characteristics exist between traumatic and non-traumatic memories, it does not necessarily implicate dissociation or repression as a cause or consequence.

Overall, there is much to appreciate in Mazzoni et al. (2025). Their paper took a middle ground in the debate, considering evidence from opposing perspectives, and assessing merits and flaws in relation to both sides. Yet even with this open-minded approach, it is crucial to stress that not all evidence carries equal weight. For instance, a primary source of evidence for which traumatic memories

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are deemed so special is derived from neuro-related data. This body of research substantiates that traumatic memories may possess specific neurobiological and neuropsychological underpinnings, suggesting qualitative distinctions in the encoding, consolidation and retrieval processes compared with other memories (e.g. ordinary experiences), thereby entailing special mechanisms distinct from general memory function (but see Rubin et al., 2008). As Mazzoni et al. (2025) rightly observed—which we expand here—a common mistake in this context involves inferring the involvement of a specific cognitive process, such as memory loss for traumatic events, from the activation of a particular area in the brain. This form of reverse inference, however, lacks deductive validity, embodying the logical fallacy of affirming the consequent. In cognitive neuroscience, it is well established that the presence of specific cognitive processes cannot be reliably inferred from observed patterns of cerebral blood flow (Poldrack, 2006). Similarly, inferring the existence of a psychiatric disorder (e.g. dissociative amnesia), solely from alterations in brain regions or hormonal (dis)functioning is methodologically unsound. In contrast, those sceptical about the impairing effect of traumatic events recognise that there exists a necessity to present robust, methodologically sound alternative hypotheses, especially in the absence of specific biomarkers for dissociative amnesia (Huntjens et al., 2022). These alternative hypotheses (e.g. organic memory loss, malingering and ordinary forgetting) are evidence-based (Jelicic, 2023; Zago et al., 2023), showing that traumatic memories occupy a distinct realm leading to severe unconscious forgetting is questionable.

Of course, as scientists, it is crucial to stay open-minded. Sometimes, despite ruling out many possibilities, explaining memory loss after trauma remains challenging. However, this complexity should not lead us to resort to phenomena or explanations for which the evidence base is weak. Considering the current state of knowledge, the evidence against traumatic memories being indeed special is likely to weigh more than the evidence in favour of the ‘specialness’ of traumatic memories.

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## DEBATE

# Comment on G. Mazzoni et al. ‘Taking the middle stance in the debate on the nature of traumatic memories’

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Mazzoni et al. (2023) adhere—as already the title of their paper indicates – to a ‘middle stance in the debate on the nature of traumatic memories’—neither fish nor fowl. In general, they stress the role of traumatic memories and also use the terms ‘amnesia’ and ‘dissociation’, but never mention ‘dissociative amnesia’. At one occasion, they write, however, that ‘these memories [= traumatic memories] are characterised by ... psychogenic amnesia’. Insofar, they seem to limit their view to the processing of traumatic memories as such. Initially, they introduce the trauma definition of the DSM-5 (APA, 2013), but later in their text, they broaden the term widely (see also Pettus, 2023).

With respect to the stress hormone thesis of the authors, this not only follows an inverted U-shape during memory consolidation, as the authors state but also can be interpreted differently, as we have done in several publications. Stress hormone receptors are highest in the amygdala and hippocampal region, where they can suppress a synchronised emotion–memory-related action of these regions during memory retrieval. Consequently, a stress hormone-related suppressed action of these regions in the right temporo-frontal hemisphere can result in a suppression or blockade of episodic-autobiographical memory retrieval (Brand et al., 2009; Staniloiu et al., 2011; Staniloiu & Markowitsch, 2010).

In our eyes, it is especially important to divide memory into episodic-autobiographical and semantic (or fact-like) memory (e.g. Markowitsch et al., 2023; Staniloiu et al., 2018; Staniloiu et al., 2020a; Staniloiu et al., 2020b; Staniloiu & Markowitsch, 2020), and not to speak of declarative memory, as Mazzoni et al. do. This, because usually only the episodic-autobiographical memory system is (retrogradely) impaired, while the semantic memory system still works normally (e.g. see figure 2 in Staniloiu & Markowitsch, 2014, or figure 1 in Markowitsch et al., 2023, or in Markowitsch & Staniloiu, 2022).