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## Neuropsychology

# Dissociative amnesia: Disproportionate retrograde amnesia, stressful experiences and neurological circumstances



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### ABSTRACT

Dissociative amnesias have been reported in neurological episodes mild enough to not cause any visible lesions on morphological examination. Disproportionate retrograde amnesia with or without identity loss happens in the context of psychological trauma (known or not). In metabolic imaging studies, some authors have reported functional alterations, particularly in the bilateral hippocampus, right temporal regions and inferolateral prefrontal cortex, despite normal morphological imaging. To avoid the presumption of an organic, psychogenic or mixed origin for such changes, De Renzi et al. suggested the term ‘functional amnesia’ to describe the condition. Patients have sometimes recovered during events similar to those preceding the amnesia in either a spectacular fashion or never. Also, in some cases, distraction or sedation may trigger the start of recovery. During psychotherapy, one patient remembered seeing a car on fire when he was a boy, and his amnesia started when his house was on fire. This suggests control by the frontal cortex, with repression blocking amnesic traces in the new emotional and biological context.

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## 1. Introduction

Dissociative amnesia is characterized by retrieval blockade of episodic autobiographical memories arising in the context of psychological trauma (whether known or not), with no evidence of brain damage on structural imaging [1–4]. Patients experience a disruption of self [5]. Put simply, the common characteristic of all these conditions — regardless of cause or mechanism — is that they are clinical disorders involving disproportionate retrograde amnesia. The definition of

dissociative amnesia is given in the 2017 French International Classification of Diseases and Related Health Problems (CIM-10) as “a disorder characterized by a retrospective gap in memory of important personal information, usually of a traumatic or stressful nature; the memory loss far exceeds ordinary forgetfulness and is not the result of substance use or the consequence of a medical condition”. The term ‘psychogenic amnesia’ is considered an approximate synonym. According to the 2013 Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) [6], amnesia can be lacunar or total with or without amnesia of identity.

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## 2. Disproportionate retrograde amnesia

This rare clinical condition can be described according to its extent as lacunar, massive or total amnesia; its duration as transitory with partial or long-lasting recovery; its profile as either isolated episodic biographical amnesia, global biographical amnesia (episodic and semantic) or biographical amnesia (isolated or global); and by whether it is accompanied by other disorders, such as collective amnesia (specifying the sector involved, such as famous people, public events) and, more rarely, procedural amnesia. The two main symptoms of dissociative amnesia are loss of identity and whole-life amnesia. Through distraction or sedation [7], however, physicians may be able to detect some preservation of memory as the patient's attention is directed elsewhere. The particular severity of a patient's amnesia could reflect the phenomenological representation of human memory that such patients have. Amnesia conversion will then need to include a role for social influence and symbolic amnesia [5].

However, the clinical pattern cannot easily differentiate amnesia patients with or without a mild neurological context. When Kritchevsky et al. [8] studied 10 patients, seven had loss of identity, eight had one or more neurological abnormalities and a further eight had significant premorbid psychiatric histories, including conversion symptoms in two cases. It is important to note that the literature shows wide variability in recovery: when it happens, it usually takes a few days to 'lift', although it may sometimes convert in spectacular fashion. This was the case with three patients, reported by Stracciari et al. [9], all of whom recovered in less than a week. Recoveries have also been reported following situations involving a similar context: patient P.N. [10] recovered after seeing a funeral scene on television (a similar episode had preceded the amnesia); while playing tennis, patient M.M. [11] saw himself playing an earlier match; and patient G.R. [11] re-experienced an earlier instance of anesthesia during subsequent anesthesia.

Nevertheless, a number of patients fail to recover. Patient A.M.N. [2] developed amnesia after discovering a fire, yet did not recover despite remembering a traumatic childhood incident. However, the fact that some patients recover suggests there may be a 'blocking' of access to past memories, probably caused by a disturbance of control phenomena, although the underlying mechanism remains unknown. Motivational and emotional control processes could be blocking the more executive control processes involved in seeking out memories, as it appears these three types of control can be described independently at a neuronal level [12].

The 'lifting' of the disorders experienced by patient F.F., the associations made by the patient and the fact that nothing had been forgotten (ecmnesia) all point towards a control problem and the possibility of resolving it by 'working' on the symptoms or removing the traumatic stress [7,13]. However, disorders may still not disappear when access, convergence or storage systems are destroyed and in cases where traumatic stress can only be overcome by definitive distancing, just as it is possible for neurological disorders to not recover when diffuse lesions disrupt the system of access or destroy memory stores. In addition, the fact that some highly intense levels of

oxidative stress can cause neuronal destruction cannot be ignored [1]. All medical disorders, including psychiatric ones, are organic or somatic and, thus, our medical language needs to be updated across the international literature and in clinical practice. If a dichotomy is to be maintained, the terms 'psychiatric disorder' and 'non-psychiatric disorder' are preferable to 'organic disorder' and 'non-organic disorder' [14].

## 3. Stressful experiences and neurological precipitants

The loss of autobiographical memory may arise after traumatic or stressful experiences. Retrograde amnesia is the result of changes in activation of executive functions [15], and inhibition of memory retrieval has been linked to functional changes [2,16–18]. The term 'functional amnesia', proposed by Markowitsch et al. [2], refers to cases following a neurological condition precipitating even minor illness, with no brain abnormality detected by conventional electrophysiological investigations and high-resolution structural neuroimaging, and/or emotional precipitants that may yet be unknown. Patient A.M.N., in an unclear neurological context (calling the fire brigade because of a fire in his attic) with no suspicion of anoxia, and a psychological context suggesting that a traumatic memory from early childhood may have helped to trigger the condition (during psychotherapy, he remembered seeing a car in flames on the motorway with the driver trapped by the fire, a scene that he suppressed, but which was confirmed as true by his mother), underwent a positron emission tomography (PET) scan, which showed a significant reduction in cerebral blood flow involving the hippocampus, but which was, in fact, more widespread than that.

The term 'functional amnesia', proposed by De Renzi et al. [1], suggests that the diagnosis may be non-organic. The neurological precipitant could be a biological or psychological precipitant ('irritative' symptoms). Dissociative amnesia has been variously qualified as 'hysterical', 'conversive' and 'psychogenic' but, in fact, it corresponds to functional amnesia [17,19]. In 2014, Staniloiu and Markowitsch [20] concluded that "dissociative amnesia is characterized by functional impairment. Additionally, preliminary data suggest that affected people have an increased and possibly underestimated suicide risk. The prevalence of dissociative amnesia differs substantially across countries and populations. Symptoms and disease course also vary, indicating a possibly heterogeneous disorder. The accompanying clinical features differ across cultural groups. Most dissociative amnesias are retrograde, with memory impairments mainly involving the episodic-autobiographical memory domain".

While few neurological cases have been reported in the literature, it should be emphasized that most observations involved diffuse pathological conditions, apart from one exceptional case of a lesion in the fasciculus uncinatus in the context of benign traumatic brain injury (TBI) [21]. The main clinical situations associated with pure retrograde amnesia are TBI [8,21–23], stroke [10], colloid cyst [24], meningioma treated with surgery and radiotherapy [25], encephalitis [26–29] and vasculitis [30], and three general

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