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A Critical Review of Case Studies on Dissociative Amnesia

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Abstract

Dissociative amnesia, defined as an inability to remember important autobiographical experiences usually of a stressful nature, is a controversial phenomenon. We systematically reviewed 128 case studies of dissociative amnesia reported in 60 papers that appeared in peer-reviewed journals in English over the past 20 years (2000-2020). Our aim was to examine to what extent these cases met core features of dissociative amnesia. All cases were about reports of autobiographical memory loss, but the evidence offered in support of a dissociative amnesia interpretation was often weak and plagued by an ambiguous heterogeneity with respect to nature, aetiology, and differential diagnoses of alleged memory loss. Most case studies failed to rule out plausible alternative explanations of dissociative amnesia, such as ordinary forgetting and malingering. We encourage clinicians and researchers to more critically investigate alleged cases of dissociative amnesia and provide criteria for how a dissociative amnesia case ideally would look like.

Keywords: Dissociative Amnesia; Organic Amnesia; Trauma; Ordinary Forgetting; Malingering

A Critical Review of Case Studies on Dissociative Amnesia

The inability to remember past or new information is defined as amnesia (i.e., retrograde or anterograde memory loss, respectively), which oftentimes is due to various types of brain dysfunction (e.g., Parkin, 1997). However, sometimes, reported memory loss of outstanding autobiographical events cannot be easily explained by brain injury or transient neurological disturbances (e.g., partial complex seizure, transient global amnesia). In these circumstances, clinicians may invoke psychogenic antecedents (e.g., overwhelming stress) to explain autobiographical memory impairment and interpret it as dissociative amnesia, also referred to as psychogenic or functional amnesia (i.e., memory loss due to dissociative or repressive coping). However, some scholars have criticized dissociative amnesia as an explanatory concept because it seems difficult to differentiate from well-established phenomena such as ordinary forgetting (McNally, 2004; Merckelbach et al., 2003; Pope et al., 2007). The controversial status of dissociative amnesia in psychology boils down to the question how people remember traumatic or highly stressful autobiographical experiences (Holmes, 1990; Pope & Hudson, 1995). Whereas some scholars postulate that, in general, traumatic experiences are well-remembered (e.g., McNally, 2005; Manzanero & Palomo, 2020), others claim that, in exceptional cases, traumatic events can lead to dissociative amnesia (e.g., Dalenberg et al., 2020).

What Is Dissociative Amnesia?

Dissociative amnesia has its historical roots in 19th century French psychology (Hacking, 1995), but as a concept it has stood against the test of time. According to the widely accepted Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013, p. 298), dissociative amnesia is (a) “an inability to recall important autobiographical information, usually of a traumatic or stressful nature, that is inconsistent with ordinary forgetting”, (b) “that causes significant distress in social, occupational or other important area of functioning”, (c) “not attributable to psychological effects of substance (e.g., alcohol or drugs), neurological, or medical condition”, and equally (d) “not better explained by other psychological disturbances such as (among others) post-traumatic stress disorder, neurocognitive disorders, traumatic brain injury and factitious disorder”. Dissociative amnesia has been said to occur in the context of fugue states, a condition in which memory

and sense of identity are compromised, leading individuals to lose their autobiographical memory (e.g., McKay & Kopelman, 2009; see, for an historical review, Hacking, 1997). It has also been described as a symptom accompanying severe Post Traumatic Stress Disorder (PTSD; e.g., Choi et al., 2017).

According to the DSM-5 (APA, 2013), dissociative amnesia can take on three forms: Localized, selective, or generalized. Whereas localized amnesia refers to memory loss for a circumscribed life-time period (e.g., abuse that occurred during childhood), selective amnesia refers to individuals being able to recollect some pieces but not the entire event. Although localized and selective amnesia may co-occur, localized amnesia is assumed to be the most prevalent type (APA, p. 298). Generalized dissociative amnesia, which is considered to be rare (p. 298, ibid), refers to a total memory loss for one's autobiographical history and oftentimes identity. The DSM-5 (APA, 2013) also assumes that people with dissociative amnesia are frequently unaware of their memory problems. Furthermore, a commonly voiced view is that people with dissociative amnesia rarely exhibit anterograde memory impairment (Kopelman, 2000; McKay & Kopelman, 2009).

The prevalence of dissociative amnesia reports in the general population is estimated to be in the 1.8 - 7.3% range (e.g., Spiegel et al., 2011; see also Staniloiu & Markowitsch, 2014), and researchers report that men and women are evenly represented (Maldonado & Spiegel, 2008; Staniloiu & Markowitsch, 2012). There is evidence suggesting that dissociative amnesia reports are among the most prevalent dissociative symptoms, both in the general population (e.g., 7.3%; Sar et al., 2007) and in clinical settings (e.g., 7.3-13.4%; Ross et al., 2002), although some researchers have also commented on the suboptimal reliability of diagnostic tools to detect dissociative amnesia (Ross et al., 2002). There is one context in which reports of dissociative amnesia are particularly prevalent: Forensic settings. For instance, Cima and colleagues (2003) found in their sample of 308 forensic inpatients, most of whom had committed violent crimes, that 72 of them (23%) claimed either total or partial amnesia for their crimes (see also Pyszora et al., 2003). The high prevalence of dissociative amnesia claims among perpetrators of violent crimes brings home the point that dissociative amnesia is a self-reported experience that might be amenable to strategic control (e.g., malingering; Cima et al., 2003).

Still, people who report dissociative amnesia are commonly hypothesized to have experienced a trauma, such as child abuse and victimization. They might re-experience traumatic events through dissociative flashbacks, and many report a history of self-destructive behaviors including suicide attempts (pp. 299-300, APA, 2013). Patients diagnosed with dissociative amnesia may report memory loss for hours, days, or even longer. The amnesic onset, triggered by precipitating episodes, may be sudden and the same is true for recovery (Lucchelli et al., 1995), although some people have been reported to gradually regain their memories years later. Reliable estimates of the number of patients who ostensibly recovered their forgotten memories are lacking, even though Pyszora and co-workers (2003) found in their forensic sample a recovery of 61% (both complete and partial return of memories). According to the DSM-5 (APA, 2013), in some cases dissociated memories are restored quite rapidly, while other patients never fully recover them. There are suggestions in the medical and psychological literature that specific treatments (e.g., benzodiazepines; Seo et al., 2013) may assist individuals with dissociative amnesia to recover their memories. Some authors advocate psychological support, "gentle suggestion", and psychotherapy to help patients to recover their forgotten memories (e.g., Brandt & van Gorp 2006). The number of psychotherapeutic interventions for dissociative amnesia is limited, ranging from cognitive behavioral therapy to hypnotic techniques (e.g., Cassel & Humphreys, 2016; Toussi et al., 2014).

Starting with Schacter's and colleagues' (1982) case study of dissociative amnesia, authors have used a broad variety of testing tools to document and characterize dissociative memory loss in individuals. Thus, tests of retrograde episodic and semantic memory functioning (e.g., Kopelman, 2000; Kritchevsky et al., 2004; Markowitsch & Staniloiu, 2013) have been employed, but also tests of anterograde memory (e.g., McKay & Kopelman, 2009; Staniloiu et al., 2018), as well as autobiographical memory interviews (e.g., Brand et al., 2009; Fujiwara et al., 2008). Similarly, authors have administered memory tests along with tests of, for instance, attention capacity, executive functions, intelligence (e.g., Fujiwara et al., 2008; Reinhold & Markowitsch, 2007; 2009), and/or symptom validity (e.g., Staniloiu et al., 2018). Moreover, a number of authors have included data from neuroimaging techniques, such as structural magnetic resonance imaging (MRI), computed tomography (CT), or positron emission tomography (PET) to substantiate that their dissociative amnesia patients did not suffer from structural

brain dysfunction (Brand et al., 2009; Efrati et al., 2018; Staniloiu et al., 2018; Thomas-Antérion et al., 2014).

Repression and Dissociation

Paraphrasing Hacking (1995), one could say that in their description of dissociative amnesia, many contemporary authors are the heirs of Pierre Janet's (1907) work on dissociation and Sigmund Freud's (1893) early work on hysteria (see also Breuer & Freud, 1895). Janet argued that just as a brain trauma may underlie memory loss, a psychological trauma has the potential to create amnesia. Freud believed that hysteria, including memory loss, was symptomatic of repressed memories of sexual abuse during childhood. Although Freud abandoned this theory later in his career, the concept of repression acquired momentum during the 20th century and was co-opted by mainstream psychology (Hornstein ,1992; Crews, 1995; Erdelyi, 2006). The key idea here is that, in order to deal with the traumatic or stressful experiences, individuals unconsciously repress their aversive memories, thereby manifesting amnesia for them. According to the Freudian view, repressed memories are not permanently lost because they can implicitly re-surface through emotions and behavior, and their explicit reintegration into consciousness (i.e., recovery) may occur during skilful therapy.

A number of contemporary researchers and clinicians prefer to interpret amnesia in terms of dissociation rather than repression, arguing that dissociation is the mechanism allowing individuals to block unwanted memories (Brown & van der Hart, 1998; Chu et al., 1999; van der Hart, 1996; van der Kolk & van der Hart, 1989). Thus, dissociative amnesia is both a descriptive and an explanatory concept. More specifically, dissociative amnesia is assumed to represent a natural human response to traumatic events (e.g., wars, natural catastrophes, crimes, and childhood abuse), wherein the inability to remember the past – not better explained by brain dysfunctions – is a psychogenic form of coping with the trauma. This assumption has been conceptualised in several models, which explicate both onset and maintenance of the dissociative amnesia state (see Staniloiu et al., 2020; Staniloiu & Markowitsch, 2012). The common denominator of those models is that dissociative amnesia for autobiographical experiences (or parts of them) does not entail that memories are gone. Rather, they are temporarily unavailable. Evidence for this has been primarily based on two observations. First, there are, indeed, individuals who eventually

seem to regain access to their forgotten memories (e.g., Chu et al., 1999; Lucchelli et al., 1995). Second, some psychotherapeutic treatments, such as hypnosis, are said to support dissociative patients in gradually regaining their own past (e.g., Cassel & Humphreys, 2016; Fine, 2012). Note that a subset of individuals recovering memories during therapy reported to suffer from Dissociative Identity Disorder (i.e., DID; formerly called Multiple Personality Disorder) (see Patihis & Pendergrast, 2019). DID consists of an identity disruption characterized by two or more diverse personality states (APA, 2013). Much debate has surrounded the relationship between DID and dissociative amnesia. Some scholars have argued that there exist amnestic barriers between personality states resulting in an inability to recall traumatic events from certain identities (e.g., Dalenberg et al., 2012). However, research has shown that there actually is transfer of autobiographical memories between or across different personality states, rendering the idea of traumatic memory loss unlikely (Huntjens et al., 2012; see also Marsh et al., 2021). Critics contend that DID and dissociative amnesia may be fuelled, perhaps even iatrogenically created by social pressure originating from books, media, and therapists (e.g., Lilienfeld et al., 1999; see also Pope et al., 2006).

Regardless of the nomenclature adopted, repression and dissociation share similar historical roots. Furthermore, some scholars argued that repressed memory and dissociative amnesia are highly overlapping construct (e.g., Holmes, 1994; Otgaar et al., 2021; Pope et al., 2006). Otgaar and colleagues (2019) pointed out that in the last decade, the concept of dissociative amnesia replaced repressed memory, likely because Freudian repression fell into disgrace after the 1990s (see Crews, 1995), leading to what is called the jingle jangle fallacy (i.e., using different terms for the same construct; Lilienfeld et al., 2015). The conundrum here is that dissociative amnesia is widely accepted as a real and unproblematic phenomenon given its presence in the DSM-5 (APA, 2013).

The Controversial Aspects of Dissociative Amnesia

When people claim that they suffer from a lack of autobiographical memories, such a statement is basically a self-report referring to memory impairment. Self-reported memory impairments are not necessarily accurate. For instance, in their lab studies, Belli and colleagues (1998) found that requiring participants to retrieve more childhood memories led to judgments of having poorer memory of one's

childhood (see, for a partial replication, Merckelbach et al., 2001). This paradoxical phenomenon challenges the validity of dissociative amnesia reports that emerge in the context of memory recovery attempts (see below). Another meta-memory aspect of dissociative amnesia reports was demonstrated in the pioneering study of Parks (1999; see also Taylor et al., 2020), who probed participants to think of vivid childhood memories and then, after a short while, asked them to indicate how recently they had thought about these memories. Many participants underestimated their prior remembering, (i.e., they unintentionally overestimated their incomplete memory; see, for a replication, Merckelbach et al., 2006; see also Arnold & Lindsay, 2002).

Moreover, reports of dissociative amnesia can be easily malingered (Centor, 1982; Jelicic & Merckelbach, 2007; Peters et al., 2013). Typically, malingering of symptoms (e.g., amnesia) can occur in situations where financial and/or legal stakes are high (APA, 2013), although sometimes invalid symptom reports might be motivated by internal incentives (e.g., playing the sick role in factitious disorder; but see Merten & Merckelbach, 2020). As mentioned above, approximately 20% of violent offenders claim amnesia for their crimes (e.g., sexual assault, homicide; Cima et al., 2002; Jelicic, 2018). By doing so, malingerers try to obstruct police interrogations or interfere with trial proceedings (Mangiulli et al., 2018; Tysse & Hafemeister, 2006). In civil forensic settings, individuals might malinger amnesia symptoms in an attempt to seek financial compensations such as insurance fees and disability pensions. However, because of the wide-spread assumption that malingering is most likely to occur in criminal and civil law contexts (Merckelbach et al., 2009; Mittenberg et al., 2002), practitioners may underestimate its prevalence in clinical settings (McCarter et al., 2009; see also Dandachi-FitzGerald et al., 2011).

Diagnosing reports of autobiographical memory impairments as dissociative amnesia requires exclusion of alternative interpretations. Malingering is only one of these alternatives. There are several other important alternatives, but they are not always easy to rule out. For instance, Williams (1994) interviewed 129 women (aged 18-31) who had been abused 17 years earlier. Some of them (n = 33) failed to report the critical event, whereas others (n = 16) denied the event, although the author had hospital records to substantiate the abuse. The author reasoned that the non-reporting could not simply be accounted for in terms of ordinary forgetting (Williams, 1994; Brown et al., 1998; see also Dalenberg,

1996) and pointed in the direction of dissociative amnesia. However, there might be other explanations such as feeling embarrassed, being ashamed, or a failure to encode the abusive event (e.g., childhood amnesia). These explanations were not ruled out in this study, meaning that we do not know to what extent the non-reporting in this study truly reflects dissociative amnesia. Importantly, lack of disclosure of traumatic experiences does not necessarily correspond to an inability to remember the trauma. Many trauma survivors prefer not to think of or talk about their traumatic past episodes (e.g., Goodman-Brown et al., 2003). Also, what is described as dissociative amnesia might instead reflect either a failure to encode (part of) the past experience, every-day forgetting, or both (e.g., McNally, 2003; Patihis et al., 2019).

Recently, Harrison and colleagues (2017) reported 53 cases of retrograde memory loss, which they described as psychogenic in nature. Even though the authors observed that a history of brain damage often preceded psychogenic amnesia (p. 2507, ibid), in none of the cases brain dysfunction was excluded as an alternative explanations of patients' psychogenic memory impairments. This issue is important because some authors have argued that organic amnesia might be easily misinterpreted as dissociative forgetting (e.g., McNally, 2003; 2007).

Thus, dissociative amnesia is supposed to be more than just not thinking about or not reporting an event. Rather, it refers to a condition in which traumatic memories were stored, but are temporarily inaccessible for conscious inspection due to dissociative coping. However, the idea that psychological trauma can lead to memory loss is difficult to reconcile with evidence suggesting that traumatic events are generally well remembered (McGaugh, 2006; McNally, 2005). Still, the sudden recollection of trauma is often seen as a strong indication that the person previously must have suffered from dissociative amnesia or repressed memory, especially if memories pertain to an adverse childhood. Arguably, such interpretation touches upon the debate surrounding the existence of repressed memory (i.e., Memory Wars; Crews, 1995; Otgaar et al., 2019).

The Scope of the Current Review

Given that several alternative explanations for reports of memory loss exist, how convincing is the evidence in favour of a dissociative amnesia interpretation that case studies offer? With this key question

in mind, we critically reviewed published case studies on dissociative amnesia, and evaluated whether alternative interpretations were sufficiently ruled out. Specifically, we systematically gathered dissociative amnesia cases that appeared in English and peer-reviewed journals over the last 20 years (2000-2020). In doing so, we first determined whether the dissociative amnesia cases were in line with the diagnostic features of dissociative amnesia as indicated in the DSM-5 (APA, 2013). Next, we focused on whether alternative explanations for dissociative amnesia were not merely considered, but actively ruled out. We argued that stringently ruling out alternative reasons for patients' functional memory loss would represent a fair way to evaluate the evidential value of case reports in favour of dissociative amnesia.

Method

Sampling Procedure

A literature search was carried out (between November 2019 and March 2020) to identify case studies that could be included in our review. Our literature search covered the period from 2000 to 2020. This was done because terminology, methodology, and ethical issues (e.g., anonymization) have become more uniform over the past two decades. Specifically, it is only in the past 20 years that (neuro)psychological tests, such as the Autobiographical Memory Interview (Kopelman, 2000), and symptom validity tests, such as the Structured Inventory of Malingered Symptomatology (Smith & Burger, 1997), have become widely available and to some extent standardized. Much the same is true for neuroimaging technology. Because we wanted to ensure that the case studies we included could have used such instruments, we focused our search on a period of twenty years. For instance, it would make little sense to conclude that early case studies on dissociative amnesia did not sufficiently rule out feigning as an alternative account when the authors of these studies had no access to symptom validity tests with which one can screen for feigning. Search terms were the following key words, which were used for separate queries: Dissociative, psychogenic, functional, and hysterical amnesia, dissociative fugue, red-outs, and repressed and recovered memory. Using these search terms, a total of 220 articles

were located using PsycINFO and Google Scholar[1], and manually retrieved papers from reference lists within articles. Three inclusion criteria were used to select articles for the current review: The articles had to be peer reviewed, had to be written in English, and had to describe at least one case of dissociative, psychogenic, functional or hysterical amnesia. Sixty articles met our inclusion criteria. Of those, 44 articles (73.3%) reported a single case study, whereas 16 (26.7%) described multiple cases. In total, the 60 articles reported on 128 cases, which we evaluated using a coding scheme.

Coding scheme

On the basis of a series of consensus meetings**,** we created a scheme for coding relevant information provided by dissociative amnesia case reports. We specifically distinguished three sections in the coding scheme (see below). A pilot version of the coding scheme was evaluated by a clinical psychologist who was unaware of the goal of the current review and, in this way, a final version was developed (see Table 1).

Section 1: Descriptive Information about Dissociative Amnesia Cases. This section focused on general features of the patients and their memory loss. First, we sought to clarify whether a case was either clinical or forensically-related. We treated a case as forensically-related when (i) the described patients were involved in proceedings as victims, witnesses, claimants or suspects/perpetrators of crime (e.g., sexual abuse), and/or when (ii) the nature of the forgotten memory or, alternatively, the amnesic onset was triggered by an event that was the object of legal proceedings (e.g., amnesia following financial loss, fraud) (Cima, 2016; Rogers & Bender, 2018).

Second, we tried to identify the period for which the patients reported memory loss. Using DSM-5's description of dissociative amnesia (p. 298-299; APA, 2013), we coded whether patients' memory loss pertained to (i) early childhood events, (ii) remote events during adolescence, (iii) remote events during adulthood, (iv) recent autobiographical events, (v) life-span and loss of identity, (vi) continuous (i.e., forgetting new events as they occur), and (vii) loss of mother language. Third, and relatedly, we checked

[1]We employed Google Scholar because it is an inclusive resource that covers psychological journals not indexed by medical databases or vice versa (see also Shultz, 2007).

whether dissociative amnesia reports were accompanied by any signs of semantic memory impairment (i.e., inability to recall general context-free facts), and/or anterograde amnesia.

Fourth, we evaluated how dissociative amnesia was documented. Specifically, we aimed to determine whether the case study moved beyond self-reports. We coded for (i) the presence of neuropsychological tests (e.g., episodic memory tests, autobiographical interviews), (ii) use of neuroimaging tools (e.g., fMRI, PET, or similar), (iii) comparison with normal or control group, (iv) test-retest or observation over a longer time period, (v) collateral data (e.g., source of information other than the patients such as police and medical reports, other witnesses), and (vi) referral sources (e.g., practitioners, clinicians, judges). Fifth, we determined whether (i) memory loss was recovered, and whether (ii) the patient underwent psychotherapeutic intervention.

Section 2: Clarity and Quality of the Scientific Evidence for Dissociative Amnesia. The coding of Section 2 revolved around diagnostic features. First, we investigated whether the authors specifically referred to dissociation, repression, or both. According to many clinicians (e.g., Freyd, 1994; van der Kolk, 1994; van der Kolk & Fisler, 1995), amnesia involves a failure to report traumatic or stressful memories due to either dissociation or repression. Hence, we inspected whether the authors of our dissociative amnesia cases referred to these key concepts in their articles.

Second, we coded whether patients were given a specific type of diagnosis (i.e., dissociative, functional, psychogenic, dissociative/psychogenic fugue, and hysterical amnesia). Third, we evaluated the diagnostic features of dissociative amnesia descriptions. Specifically, we examined whether the authors of the case reports referred to diagnostic features as listed in the DSM-5[2] (APA, 2013). Thus, we checked (i) whether the authors reported a traumatic or stressful autobiographical event, which is supposed to occur prior to memory loss (we also categorized the nature of the trauma and whether it was corroborated), (ii) whether the amnesia was presented as a localized, selective or generalized form of memory loss, (iii) whether duration of dissociative amnesia was specified, (iv) whether substance abuse or medical

[2]Some papers, specifically those published between 2000 and 2013 refer to the DSM-IV or DSM -IV-TR (APA, 1994; 2000). Note, however, that the only major change from the DSM-IV/-TR to the DSM-5 is that dissociative fugue is now considered as a specifier of dissociative amnesia rather than as a separate diagnostic entity.

conditions were ruled out, (v) whether impairment following memory loss was explicitly mentioned, and finally (vi) whether the patient was unaware of his/her memory loss.

Fourth, and finally, we additionally looked for associated features commonly supporting dissociative amnesia cases. Following DSM-5 (APA, 2013), we coded whether or not the patients had experienced (i) a history of trauma, child abuse, and victimization, repeated traumatic experiences, (ii) engaged in self-mutilation, suicide attempts or other self-destructive behaviors, and (iii) dissociative flashback (i.e., behavioral reexperiencing of traumatic events).

Section 3: Alternative Explanations for Dissociative Amnesia. This section focused on three types of alternative explanations for claimed memory loss. First, we relied on the differential diagnoses[3] as indicated in the DSM-5 (APA, 2013). We specifically examined whether the authors of case descriptions explicitly differentiated between dissociative amnesia and other conditions that share similar symptoms or characteristics. Hence, we checked whether the authors ruled out (i) neurocognitive disorders, wherein "memory loss for personal information is usually embedded in cognitive, linguistic, affective, attentional, and behavioral disturbances" (pp. 300-301; ibid), (ii) substance-related disorders, such as "black-outs" due to drug or alcohol intoxication, (iii) posttraumatic amnesia due to brain injury, in which memory loss occurs after traumatic brain injury, (iv) seizure disorders, wherein individuals might report memory loss, although that is usually not related to traumatic episodes, (v) catatonic stupor, usually characterized by mutism, which superficially might look like dissociative amnesia, and finally (vi) factitious disorder, wherein individuals fabricate symptoms without any evident gain.

Second, we focused on whether the authors ruled out ordinary forgetting. Although part of the DSM-5 definition (i.e., Criterion A; APA, 2013), we effectively checked whether authors took into account that ordinary, normal forgetting could have explained the patients' inability to remember past autobiographical events. Relatedly, we coded whether the authors were sensitive to the possibility that an encoding failure might have played a role in patients' reported memory loss. Of course, ordinary

[3]We did not treat Dissociative Identity Disorder (DID) or Posttraumatic Stress Disorder (PTSD) as differential diagnoses because dissociative amnesia is thought to occur as an associated symptom in both diagnostic entities.

forgetting and encoding failure were only relevant options for cases involving localized forgotten memories (e.g., those that pertained to childhood events). We did not code for ordinary mnemonic mechanisms as alternative explanations in cases of life-span memory loss or long amnesic periods (i.e., patients who claimed not to remember the last 15 years of their lives).

Third, and lastly, we coded for malingering as a potential alternative explanation for patients' dissociative amnesia claims (Merten & Merckelbach, 2013). More precisely, we looked whether (i) authors considered malingering to begin with. If so, (ii) we checked whether the authors explicitly mentioned patients' potential benefits within either a civil or criminal context, (iii) we noted whether authors actually conducted a forensic assessment (e.g., forensic interview, symptom validity tests) to test whether patients were possibly intentionally over-reporting their memory loss, and (iv) we coded tool(s) that were used during the forensic examination.

Coding Procedure and Interrater Reliability

Articles (k = 60) were randomly and evenly distributed over the authorship team**,** that independently coded the information in the case reports using the taxonomy described above. The presence of the above listed characteristics in each case description was rated, such that a range of binary variables emerged (e.g., "*Was the trauma corroborated by other sources?*"). If a characteristic was not reported or mentioned within the case report under consideration, the feature was coded as being absent. Of course, most variables were not binary, such as the amnesic time frame (e.g., "*Amnesia pertained to recent autobiographical events*") or the type of diagnosis (e.g., "*Was the patient given a diagnosis of amnesia? If so, specify what type*"). Here, we took note of what was stated in the articles, without categorizing the remaining options as being absent.

An independent researcher, unaware of the scope of this review, received the characteristics previously listed and was instructed to examine 25% of the dissociative amnesia articles under investigation (n = 15). Her coding was compared with those of the authors, and every discrepancy was resolved vis-à-vis among the coders. We computed interrater reliability statistics using Krippendorff's α (Kα; Hayes & Krippendorff, 2007). Kα yields conservative reliability estimates for judgments with two or more raters, with or without missing data. Table 1 shows agreement for coded variables. Agreement

levels were overall high (range: .76-1.0; *Mdn* = .91), with 14 of the 21 characteristics reaching at least .90 agreement and only three characteristics an agreement of less than .80.

Table 1. Variables of coding scheme and inter-rater agreement.

	Krippendorff's α Reliability	
Features	**α**	**95% CI**
Section 1		
Case Type	1	[1, 1]
Amnesic Time Period	.96	[.87, 1]
Additional Memory Impairments	.76	[.60, .92]
Documentation	.93	[.83, 1]
Amnesia Recovery	.78	[.61, .96]
Psychotherapy Treatment	.93	[.79, 1]
Type of Psychotherapy	1	[1, 1]
Section 2		
Concepts	.90	[.75, 1]
Amnesia Diagnosis	.91	[.78, 1]
Amnesia Diagnostic Features	.83	[.69, 96]
Trauma	.93	[.78, 1]
Type of Trauma	.88	[.72, 1]
Trauma Corroboration	.91	[.73, 1]
Amnesia Associated Features	.71	[.46, .90]
Section 3		
Differential Diagnosis	.92	[.80, 1]
Ordinary Forgetting	.91	[.74, 1]
Encoding failure	.91	[.74, 1]
Malingering	.93	[.80, 1]
Context	.91	[.74, 1]
Forensic Examination	.84	[.60, 1]
Tools Used	.83	[.51, 1]

Note: Each estimate is the result of 10.000 bootstraps. CI corresponds to confidence interval.

Results

The SPSS data matrix, along with the coding scheme and the list of articles used for the current review, can be found on the Open Science Framework (osf.io/ebjwh).

Descriptive Information

Of the 128 individuals described in the case reports, 60.9% (*n* = 78) were men. The age range for the total sample varied from 11 to 66 years (*M* = 35.33; *SD* = 12.57; *n* = 2 missing data). The majority of the cases (80.5%, *n* = 103) was clinically based, whereas the remaining (19.5%, *n* = 25) was forensically-related.

Amnesic Period. Although the DSM-5 (APA, 2013) suggests that localized amnesia is the most common type of dissociative amnesia, 75% (*n* = 96) of the cases involved extended life-time periods (e.g., life-span). In 24.2% of cases (*n* = 31) memory loss pertained to circumscribed autobiographical events (e.g., recent autobiographical events). We excluded one single case study (.8%; Iglesias & Iglesias, 2009) about an individual who "solely" forgot his native language, but nevertheless was presented as someone suffering from dissociative amnesia. Among those who had amnesia for an extended period, the majority suffered from identity loss and, consequently, generalized amnesia for their entire life (68.8%; *n* = 66). Relatedly, two other individuals who reported life-span memory loss additionally lost their ability to speak their native language (2.1%; 1.6% of the total). Also, among those with circumscribed amnesia, 74.2% (*n* = 23) reported memory loss only for recent autobiographical events. Appendix 1 shows details of patients' amnesic periods.

Additional Memory Impairments. A minority of 22.7% (*n* = 29) also reported semantic memory problems, while 10.9% (*n* = 14) exhibited features of anterograde amnesia. In 10.2% (*n* = 13) of cases, individuals showed both semantic and anterograde memory impairments, while in 18% (*n* = 23) of the cases, no additional memory impairments were observed by the authors, even though patients were explicitly tested for those deficits. Finally, we observed that in 38.3% (*n* = 49) of the cases, information about the patients' semantic and/or anterograde memory issues was absent.

Examination. Neuropsychological tests were used most often to examine cases of dissociative amnesia, either in combination with other tools such as neuroimaging (17.2%; *n* = 22), or as single

diagnostic method (16.4%; *n* = 21). In 9.4% (*n* = 12) of the cases, dissociative amnesia was not substantiated with psychometric or neuropsychological tools (see Appendix 2 for the remaining cases).

Recovery. Apparently, 43% (*n* = 55) of the patients did not recover their memory, whereas 28.9% (*n* = 37) restored fully and 11.7% (*n* = 15) recovered partially their memory. In 16.4% (*n* = 21) of the cases, no information was reported about patients' recovery. Moreover, among all the patients, we observed that 22.7% (*n* = 29) were given psychotherapy. For the remaining group, information about psychotherapeutic treatment was absent. A contingency table analysis plotting memory recovery against psychotherapeutic treatment showed a statistically significant effect, χ^2 (3, *n* = 128) = 38.58, *p* < .001, *Cramer's V* = .549. Post-hoc tests were conducted using Bonferroni correction (Beasley & Schumacker, 1995; Garcia-Perez & Nunez-Anton, 2003). Among those who received psychotherapeutic treatment, 69% (*n* = 20) of individuals restored their memory, an association that statistically significantly deviated from the null hypothesis (*p* < .001). On the other hand, 6.9% (*n* = 2) of those who underwent psychotherapy did not recover their memory. Again, this relationship statistically significantly deviated from the null hypothesis (*p* < .001). Furthermore, 20.7% (*n* = 6) of individuals who underwent psychotherapy partially recovered their memory (*p* = .349), while no information about memory recovery was provided about one single dissociative amnesia patient who received psychotherapy (3.4%; *p* = .129). These percentages did not statistically significantly differ from the null hypothesis. Of those 29 individuals who received psychotherapy, 42.9% (*n* = 12) were given hypnosis or hypnotherapy; 10.7% (*n* = 3) underwent supportive psychotherapy; five patients were exposed to either imaginal exposure therapy, relaxation therapy, mindfulness, cognitive behavioral therapy, or the latter one in combination with Eye Movement Desensitization and Reprocessing (i.e., EMDR; 3.6% each). Finally, in 28.6% (*n* = 8) of the cases, the type of psychotherapy was not specified. The relationship between type of psychotherapy and memory recovery was not statistically significant, χ^2 (21, *n* = 29 = 13.31, *p* = .897, *Cramer's V* = .392.

Clarity and Quality of Evidence for the Dissociative Amnesia Cases

Concepts. In 41.4% of the case reports (*n* = 53), researchers referred to dissociation as a theoretical account for the reported memory loss, whereas in 19.5% (*n* = 25) of the cases authors referred to

repression. In 14.8% (*n* = 19) of the cases, authors employed both constructs interchangeably. However, a non-trivial percentage of authors did not mention either of the concepts (24.2%; *n* = 31).

Diagnosis. Across all the cases (*N* = 128), 79.7% (*n* = 102) of the patients received a diagnosis, while in the remaining cases no diagnostic information was reported. More than half of the diagnosed patients were given the label of dissociative amnesia (63.7%; *n* = 65), 18.6% (*n* = 19) were diagnosed with functional amnesia, 8.8% (*n* = 9) with dissociative/psychogenic fugue, 6.9% (*n* = 7) with psychogenic amnesia, and 2 (2%) individuals received a diagnosis of hysterical amnesia.

Trauma and Diagnostic Features. Authors reported traumatic or stressful episodes prior to the onset of amnesia in 96 cases (75%). In 27 out of 96 (21.1%) cases, traumatic or stressful events were corroborated. Figure 1 specifies the type of trauma. Notably, most of the traumatic experiences had an organic component (e.g., mild head trauma or similar injuries, 33.3%; *n* = 32), followed by work- or life-related stressful episodes (e.g., being bullied, 22.9%; *n* = 22). In 12.5% (*n* = 12) of the cases, severe traumatic experiences during adulthood (e.g., being the victim of sexual assault or witnessing homicide) were mentioned. Severe traumatic experiences during childhood (e.g., child sexual abuse) and conflicts with relatives or partners were each mentioned in 9.4% (*n* = 9) of the cases. Moreover, 6.3% (*n* = 6) of the traumatic experiences prior to the manifestation of memory loss were related to legal issues (e.g., being confronted with an accusation). In 6.3% (*n* = 6) of the cases, traumatic experiences were not further specified.

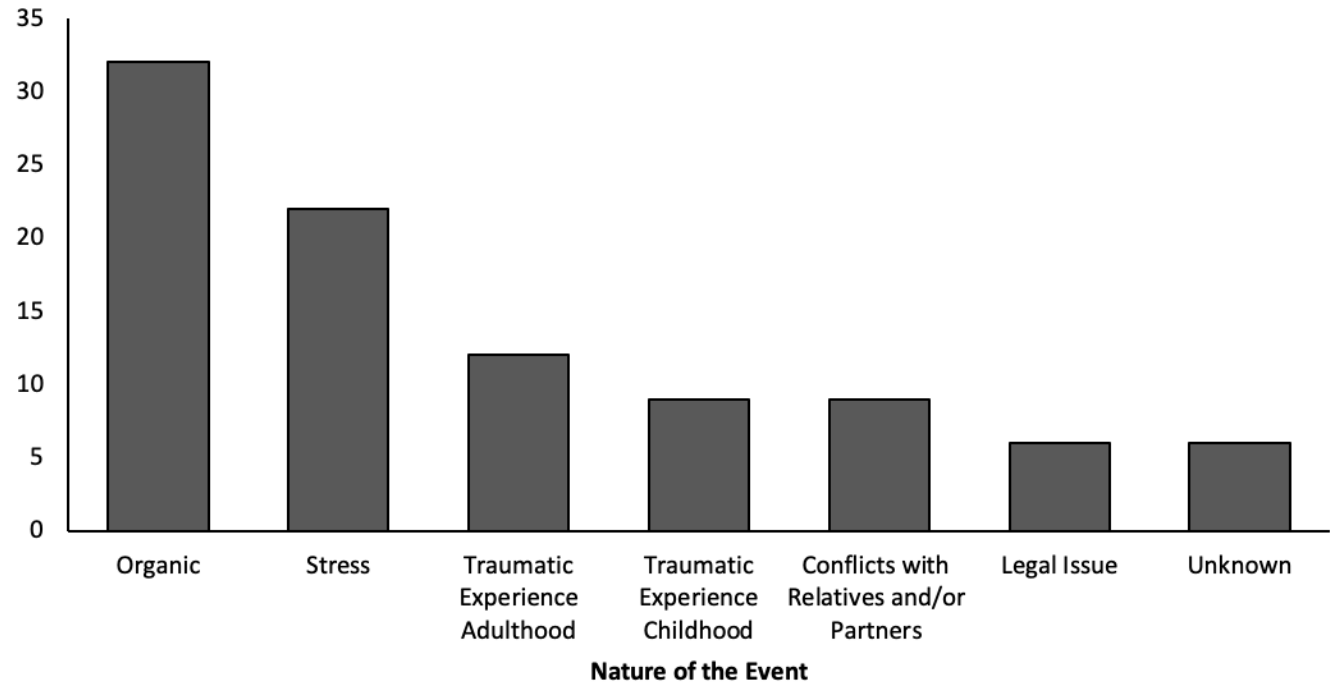

Figure 1. Frequency of several types of traumatic and stressful experiences related to the patients' onset of dissociative amnesia (in 96 out of 128 cases in which such experiences were specified).

Next, we focused on the diagnostic features of the dissociative amnesia cases in which a trauma or stressful event was mentioned as (potential) antecedent in the aetiology of the memory loss (n = 96; see Appendix 3 for a complete overview of the diagnostic features, irrespective of a traumatic antecedent). In the majority of cases (55.2%; n = 53), the authors of the articles referred to trauma, to type of memory loss, and to duration of dissociative amnesia, thereby covering 3 out of the 6 diagnostic features listed by the DSM-5 (APA, 2013). In 2.1% (n = 2; Checko et al., 2018; Kumar et al., 2007) of the cases, the authors addressed *all* the DSM-5 features, including that the amnesia was not due to substances, that patients were unaware, and that they were functionally impaired. In the remaining cases (42.7%, n = 41), authors addressed one or more of the DSM-5 features, in addition to the traumatic origin of the memory loss (see Appendix 3).

Associated Diagnostic Features. In 101 of the 128 case reports (78.9%), authors did not report any of the associated features (e.g., histories of trauma, child abuse, and victimization; self-mutilation, suicidal attempts; dissociative flashback). One patient description (.8%; Colangelo, 2006) alluded to all

listed associated characteristics. In the remaining cases, isolated associated features were reported alone or sometimes in combination with one another (see Appendix 4).

Alternative Explanations to the Dissociative Amnesia Cases

Differential Diagnosis. In 40 of the 128 case reports (31.3%), dissociative amnesia was differentiated from both neurocognitive disorders (i.e., intellectual and cognitive impairments) and posttraumatic amnesia due to brain injury. Interestingly, 20.3% (*n* = 26) of the articles did not mention or refer to any differential diagnosis. In the remaining cases, the authors did rule out neurocognitive disorders in association with one or more differential diagnosis (see Appendix 5).

Ordinary Forgetting and Encoding Failure. For this analysis, we only considered cases concerning circumscribed amnesic episodes [e.g., amnesia for event(s) occurred during childhood]. Figure 2 summarizes our findings. Of 31 cases with circumscribed memory loss, ordinary forgetting was explicitly considered as an alternative explanation for 2 patients (6.5%; Milchman, 2008; Staniloiu et al., 2020). In 3 cases (9.7%; Chadda et al., 2002; Milchman, 2008; O'Neill of Tyrone & Fernandez 2000), authors excluded failure to encode the event as an explanation for their patients' memory loss.

Malingering. We first explored malingering in those cases initially labelled as forensically-related (*n* = 25). Surprisingly, no information was provided as to possible malingering in 64% (*n* = 16) of these cases. For the total set (*N* = 128), malingering was considered in 31.3% (*n* = 40) of the cases. In the remaining subsample, no information was reported or provided by the authors with respect to malingering. We checked whether dissociative amnesia reports arose in circumstances in which the examinees might have benefitted from either financial or legal advantages. Of the 40 relevant cases, 29 reports (72.5%) did not mention the patients' potential benefits or legal advantages. In the remaining case descriptions, authors acknowledged that patients could have taken advantage from their amnesia reports, either in a civil (15%; *n* = 6) or criminal context (12.5%; *n* = 5). Furthermore, in 45% of the relevant cases (*n* = 18 out of 40), the authors conducted a forensic examination, whereas in the others, the possibility of malingering was mentioned, but not followed-up with any investigation (see Figure 2).

Among cases in which a forensic examination was conducted (*n* = 18), the most frequently used tests were: Test of Memory Malingering (ToMM; Tombaugh, 1997; Teichner & Wagner, 2004) (38.1%,

n = 8), ToMM in combination with the Amsterdam Short Term Memory Test (ASTM; Schmand & Lindeboom, 2005) (19%, *n* = 4), and ToMM in combination with the Rey 15-Items Test (FIT; Lezak et al., 2012) (14.3%, *n* = 3). In three cases, the authors either used only the FIT, the Personality Assessment Inventory (PAI; Morey, 1991), or a combination of tools such as ToMM, ASTM, FIT, and the Test Battery for Forensic Neuropsychology (Heubrock & Petermann, 2000) (4.8%; *n* = 1, respectively). Finally, in three cases (14.2%), no information was provided regarding the tools used to conduct the forensic examination.

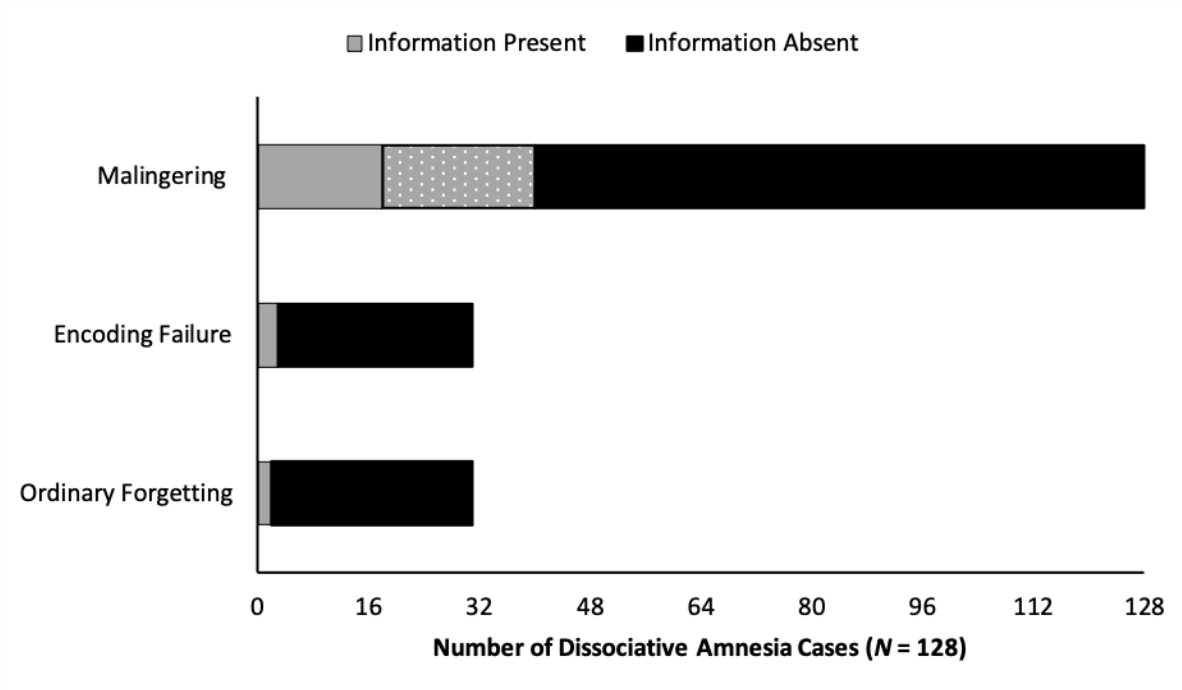

Figure 2. Overview of the alternative accounts for dissociative amnesia considered in the examined cases (*N* = 128). Note that forensic examination is displayed as a function of malingering when this latter one was present. That is, the solid grey fill refers to cases in which forensic examination was actually conducted (18 out of 40), while the pattern fill refers to cases in which no further forensic examination was assessed, despite the authors taking into account malingering (22 out of 40). Finally, note that ordinary forgetting and failure to encode the event(s) have been considered as alternative explanations to dissociative amnesia only in reports concerning circumscribed amnesic episodes (31 out of 128).

Discussion

The DSM-5 (APA, 2013) definition of dissociative amnesia encompasses several critical elements: 1a) the inability to recall important autobiographical information 1b) that is usually of a psycho-traumatic or stressful nature; 2) although the person is not always aware of his/her deficits, the memory loss interferes with daily functioning; and 3) the memory loss cannot be explained by ordinary forgetting or by conditions such as substance use, neurocognitive disorders (e.g., dementia, partial seizures), or traumatic brain injury. Over the years, researchers have further elaborated on these elements such as, for instance, the idea that psychological trauma is a prominent antecedent of dissociative amnesia (e.g., Chu et al., 1999; Freyd, 1994; Staniloiu et al., 2020; Staniloiu & Markowitsch, 2012; van der Hart, 1996).

In the current review, we screened 128 dissociative amnesia case studies published during the last twenty years to examine to what extent these case descriptions actually met the features that the DSM-5 (APA, 2013) deem to be typical for dissociative amnesia. Our main conclusion is that the overwhelming majority of case studies cover an incomplete and limited set of isolated characteristics of dissociative amnesia as portrayed in the DSM-5 (APA, 2013). Only two case studies address all DSM-5 features (APA, 2013). However, even these two cases were not particularly compelling illustrations of patients suffering from dissociative amnesia as conceptualized by DSM-5 (APA, 2013). In the first one, Chechko and co-workers (2018) described the case of a woman ("NN") with life-span memory loss due to (unknown) trauma. When compared with a control group, NN exhibited weaker involvement of the hippocampus during recollection of previously learned face-name pairs (p. 1970; ibid). However, hippocampal spreading depression is considered to be a risk factor of transient global amnesia (TGA; e.g., Jørgensen & Olsen, 1986; Tynas & Panegyres, 2020), and so, a plausible alternative account is that NN's memory deficit could have reflected TGA rather than dissociative memory loss. In the second case study, Kumar and colleagues (2007) presented a patient with severe anterograde amnesia following stress due to a failure to return money borrowed from a friend. With this particular background, malingering might have been an alternative interpretation, as the authors acknowledge in their discussion (p. 584; ibid). However, they did not conduct any further forensic examination to rule out whether their patient was malingering his amnesia.

Thus, in terms of DSM-5 features (APA, 2013), there were no strong compelling patient descriptions of dissociative amnesia that have been published over the past 20 years. We discuss in turn the key elements of the DSM-5 description (APA, 2013), the limitations of our study, and the more general conclusions that can be drawn from our findings.

Retrospective Memory Loss and Recovery

The most frequently reported dissociative amnesia characteristics were its type (e.g., generalized) and duration (e.g., life-span), whereas other diagnostic criteria (e.g., functioning impairment and unawareness) were only incidentally addressed. The large majority of case studies (75%; *n* = 96) was about patients who reported memory loss for extended life-time periods. As stated in the Introduction, reports of retrospective memory loss are, in essence, self-reports and may be inaccurate. In most case studies (90.6%; *n* = 116; see Appendix 2), authors attempted to move beyond the level of self-reported memory loss by administering tests (e.g., neuropsychological tests) and/or tools (e.g., neuro-imaging methods) and/or by consulting collateral sources. It is therefore fair to conclude that in general, the retrospective memory loss described in these case studies involved more than just a subjective metacognitive judgment.

Although the DSM-5 (APA, 2013) states that the memory loss in dissociative amnesia is "always potentially reversible because the memory has been successfully stored" (p. 298), the prevalence of memory recovery is virtually unknown. We found that the number of patients who did not recover their memory slightly exceeded those who did fully (or partially) regain their memory. Interestingly, most patients (69%; *n* = 20) who recovered their memory did so in the context of psychotherapeutic treatment. Although it is impossible to draw causal conclusions from this constellation, the association of memory recovery with psychotherapy is in itself in accordance with the idea that (a) dissociative amnesia involves temporary memory loss, and that (b) a promising way to treat patients with dissociative amnesia is through psychotherapy (e.g., Staniloiu et al., 2020). However, frequently employed interventions, such as hypnosis or EMDR, are not without problems (e.g., Houben et al., 2018; Lilienfeld, 2007; Lynn et al., 2003). Specifically, laboratory studies have indicated that hypnosis and EMDR might increase the amount of memory information reported but often at the expense of accuracy (e.g., Steblay & Bothwell

1994; Houben et al., 2020). Thus, what might look like recovery of memory loss may, in fact, involve inaccurate or even false memories that have never been dissociated to begin with. It is for that reason that some authors are critical about the potential of therapeutic techniques to recover autobiographical memories (see Loftus & Guyer, 2002; Mazzoni et al., 2010; Whitehouse et al., 1991).

Trauma and Stress

In a quarter of the case descriptions (n = 32), authors did not mention or even refer to traumatic or stressful episodes related to the amnesic onset. In some cases, it remained unclear why patients were labelled as suffering from dissociative amnesia (or similar) if neither a psychological nor an apparent organic deficit could account for those memory impairments. For instance, Reinhold and Markowitsch (2007) reported a case of a 16-year-old patient ("IK") for which the authors "could not find any stressful or distressing factors in [her] life history" (p. 57; see also case "MM" in Brand et al., 2009). Similarly, Kritchevsky and colleagues (2004) studied a series of patients with functional amnesia. Out of ten patients (of whom one eventually admitted having feigned his amnesia), four (patients 1, 4, 6, and 8) did not experience any stressful event prior to or related to their memory loss. What these patients had in common, though, was a history of substance abuse and psychiatric comorbidity, both of which perhaps may have contributed to their memory loss (e.g., Korsakoff syndrome; psychosis). Meanwhile, the DSM-5 (APA, 2013) is in no way strict or dogmatic about the connection between trauma and dissociative memory loss. All the DSM-5 (APA, 2013) states is that the retrospective memory loss is "usually" of a traumatic or stressful nature, and that psychological trauma often precedes dissociative amnesia. Obviously, such a formulation leaves room even for non-traumatic antecedents of dissociative memory loss. Furthermore, this wide definition easily invites diagnosis by exclusion: When there are no obvious organic disturbances, researchers or clinicians might be tempted to reason that the amnesia *must* therefore be dissociative in nature, irrespective of whether a traumatic or stressful event can be identified. In this regard, we concur with Lynn and colleagues (2014) who argued that the central diagnostic criterion for dissociative amnesia is perhaps too vague in stipulating that one or more episodes of inability to recall important information must be "[…] inconsistent with ordinary forgetting". What constitutes "ordinary forgetfulness" is difficult to delineate, and what is "ordinary" hinges on a variety of factors, including the

situational context (e.g., whether psychotherapeutically guided memory recovery attempts are undertaken). For instance, Read and Lindsay (2000) demonstrated that when people are encouraged to remember more about a selected target event, they report their forgetting to be more extensive, compared with individuals who are asked to simply reminisce about a target event.

In case descriptions where traumatic causes *were* linked to the dissociative amnesia reports, the most frequently identified antecedent was organic in nature (e.g., mild or minor brain injury due to vehicle accidents, falls; $n = 32$). DSM-5's (APA, 2013) acknowledgment that "mild traumatic brain injury may precede dissociative amnesia" (p. 299, APA, 2013) might have led some authors to consider brain damage as a prominent precursor of dissociative amnesia. Indeed, dissociative amnesia reports were mostly examined by administering neuropsychological tests, sometimes in combination with other instruments (e.g., neuroimaging and comparison with control group). However, Lucchelli and Spinnler (2002) speculated that subtle brain injury may go unnoticed when it falls below the sensitivity threshold of neuroimaging tools. Accordingly, these authors argued that lack of a congruent brain lesion does not necessary rule out an organic aetiology of memory loss. The problem with this type of reasoning is that it allows for untestable, not falsifiable interpretations. That is, one can always invoke unobservable organic antecedents of amnesia without being proven wrong. Still, it is true that conditions such as TGA may simulate dissociate amnesia, although TGA is often a consequence of mild head trauma (e.g., Hodges, 1998; Lewis, 1998; Lucchelli et al., 1998). In sum, then, looking at the cases in our set, it is often not clear why some authors conceptualize the memory loss as dissociative in nature when there is a clear hint in the direction of organic factors and, at the same time, psycho-traumatic or stressful experiences that precede the amnesia are absent.

A common characteristic of cases in which there was long-lasting, generalized memory impairment (e.g., extensive retrospective memory loss; see Staniloiu et al., 2018) was that the authors tended to look for any type of psychological stressors in their patients' life. Sometimes, these stressors were severe and dated back to early childhood, such as multiple sexual abuse (e.g., patient "P" in Staniloiu et al., 2018) or involved domestic violence (e.g., Helmes et al., 2015). Yet, in other cases, stressors appeared to be relatively "minor" events such as marital issues (e.g., Degun-Mather, 2002) or broken careers (e.g.,

Markowitsch & Staniloiu, 2013). More precisely, in 39 cases, the onset of dissociative amnesia was marked by work- and life-related stress, conflicts with partners or relatives, and legal issues, which all might be seen as belonging to the less spectacular range of adverse events. For instance, in their study of 28 dissociative amnesia cases, Staniloiu and colleagues (2018) reported that some of the critical accidents prior to dissociative amnesia were police accusations (patients "A", "B", and "C"), life-time inability to work in preferred job (patient "E"), arguments with a good friend (patient "M"), or with other children at school (patient "N"). Also, Lee and co-workers (2011) reported a case of an 18-years-old man who was admitted to the psychiatric facility because of his aggressive behavior, and consequently developed amnesia for it, due to "unfulfilled wishes for love" (p. 378, ibid). The theoretical problem here is that when mild stressful experiences are considered to be antecedents of dissociative amnesia (e.g., Brewin et al., 2009; McHugh & Treisman, 2007), it becomes difficult to understand why it would be so important for a person to dissociate from them.

Authors often assume that previously experienced stressful events can be latent (e.g., abuse, maltreatment) and suddenly re-activated by biological events (e.g., accident) such that both organic and psychogenic factors contribute to memory loss and its maintenance (e.g., Staniloiu et al., 2018). This type of explanation is particularly put forward to explain rare cases of anterograde (or continuous) dissociative amnesia (Staniloiu et al., 2018; but see Brandt & van Gorp 2006; Kopelman, 2000). A potential problem here is, of course, hindsight bias (e.g., Fischhoff, 1996; Merckelbach & Patihis, 2018; Patihis et al., 2019), in which memory loss is retrospectively attributed to types of psychological and biological life events that most people will experience from time to time. For instance, Fujiwara and co-workers (2008) reasoned that their patients' ("C.D.") amnesic onset must be psychogenic given the presence of conversion symptoms and somatic complaints (p. 40; ibid), even though C.D. began suffering from severe retrograde and anterograde memory impairments following a car accident.

Differential Diagnosis and Alternative Explanations for Dissociative Amnesia

As stated before, neuropsychological tests were mostly used to examine dissociative amnesia. Relatedly, the most common differential diagnoses endorsed by the authors of the case studies were neurocognitive disorders, both as standalone or in combination with others (e.g., posttraumatic amnesia

due to brain injury and substances-related disorders; Brand et al., 2009; Fujiwara et al 2008). In only six cases, authors considered three or more differential diagnoses (e.g., Hennig-Fast et al., 2008) indicated by the DSM-5 (APA, 2013), whereas in twenty-six reports we found no reference to any of them (e.g., Chadda et al, 2002; Efrati et al., 2018; Lee et al., 2011). Little attention was paid to the possibility that amnesia reports might have reflected ordinary forgetting and/or a failure to encode events. Colangelo (2009), for instance, presented a detailed case of a 23-year-old patient who recovered memories of child sexual abuse during therapy. The author explained this patient's amnesia report in terms of repression and dissociation, but did not consider that it might instead have been an instance of normal forgetting, a failure to properly encode the abuse, or simply a voluntarily decision to not disclose the experience (e.g., because feeling ashamed). Similarly, Efrati and colleagues (2018) reported a study including three women who recovered their repressed child sexual abuse memories following hyperbaric oxygen treatment. However, the authors were silent about why repression or dissociation could account for their patients' amnesia better than any other cognitive or social mechanism such as ordinary forgetting or reluctance to talk about an emotionally painful episode. In their prospective study on victims of documented child sexual abuse, Goodman and colleagues (2003) found that forgetting of trauma memories is not a common experience. The most parsimonious explanation for nondisclosure of trauma memories seemed to lack of willingness to disclose, although the researchers also found that nondisclosure was associated with higher levels of dissociative symptoms. Thus, most of the evidence adduced in support of (traumatic) dissociative amnesia could as well be reinterpreted as normal forgetting or failure to disclose, rather than being attributed to an inability to remember the trauma in itself due to repression or dissociation (e.g., McNally 2003). In this respect, the majority of the reviewed articles failed to rule out such cognitive-related alternative explanations, thereby perhaps attributing instances of ordinary forgetting to dissociative amnesia.

Finally, in more than two third of the dissociative amnesia reports (n = 88), malingering was not considered as an alternative interpretation, even when background information could have suggested the possibility of feigned memory loss. A case in point is the paper of Mizutani and colleagues (2014) about a young woman claiming selective amnesia surrounding an episode of shoplifting. In a similar vein, Brand

and co-workers (2009) did not question whether patient "HH", previously arrested for two rapes, was malingering his amnesia related to a new accusation of sexual assault. The failure to consider malingering in such case descriptions is surprising, given that there are psychometrically strong tests to rule out this differential interpretation (see Peters et al., 2013).

When malingering was considered, it was frequently assessed in a suboptimal way. In order to properly evaluate the credibility of symptom reports, clinicians are well-advised to rely on a so-called multi-method approach involving several types of tests and tasks (Boskovic et al., 2019; Jelicic, 2018; Rogers & Bender, 2018; see Marcopulos et al., 2016, for a good example in the context of dissociative amnesia). Also, some authors seemed to be reluctant to take malingering into account as a plausible explanation for memory loss claims. For instance, when discussing a patient's below-chance performance on some neuropsychological tasks, Fujiwara and co-workers (2008) stated that "although malingering might seem likely, we cannot conclude simulation without confession of the patient" (patient "G.H.", p. 42; ibid). This is in stark contrast to the broadly endorsed view of forensic neuropsychologists that below-chance performance is a smoking gun of deliberate underperformance (Binder & Chafetz, 2018). In some case studies, signs of malingering were framed as a cry for help (e.g., patients "Charles" and "Heidi", respectively, Staniloiu et al., 2020), although a cry for help is consistent rather than conflicting with deliberate fabrication of memory loss (Young, 2019). Overall, our findings support the conclusion of Jenkins, Kapur, and Kopelman (2009) that "the acceptance of 'malingering' as the most likely explanation for some cases of retrograde amnesia requires greater consideration" (p. 604, ibid).

Limitations

Our critical review of case studies has some obvious limitations. To begin with, in light of the prevalence estimates of dissociative amnesia (i.e., 1.8 - 7.3%; Spiegel et al., 2011; Staniloiu & Markowitsch, 2014), it might be surprising that we were able to locate only 128 case studies on this subject. The paucity of cases might be due to several reasons. For one thing, we restricted our review to papers that appeared in English, peer-reviewed journals. Hence, there might be case descriptions of dissociative amnesia in other languages that more fully cover the DSM-5 (APA, 2013) essentials of this disorder. More generally, there is a rich literature on dissociative amnesia and how it might be confused

with, for instance, TGA in other languages (e.g., Gil et al., 2010), that we did not include. Furthermore, clinicians might feel that dissociative amnesia is such a common clinical picture that it does not justify a case description. Thus, our set of case studies may have been plagued by selection effects. Precisely, because cases of retrospective memory loss did not fit all the features of dissociative amnesia as portrayed in DSM-5 (APA, 2013), authors may have found it important to publish case descriptions of them. Interestingly, our interrater reliability analysis indicated less than perfect agreement for several characteristics of dissociative amnesia described in DSM-5 (e.g., amnesic associated features, additional memory impairments, recovery; APA, 2013). Less than perfect agreement, however, does not necessarily reflect a limitation of our procedure. Rather, it may echo the unclarity with which the dissociative amnesia cases are presented in the literature.

Another limitation of our review is that we only looked at case studies, leaving aside the experimental literature on amnesia-like phenomena (e.g., Loftus & Burns, 1982; Hulbert, Henson & Anderson, 2016). Finally, our review does not take into account the word limits for authors of case studies. That is, many journals use words limits, which might force authors to omit interesting or even crucial background information about a dissociative amnesia case. Yet, the critical issue here is that omitting or not reporting crucial information about dissociative amnesia patients may hinder our understanding of this condition.

Conclusion and Future Recommendations

Based on historical considerations, some critics have argued that dissociative amnesia is not a natural neuropsychological category (such as, for instance, hallucinations), but rather a culture-bound syndrome (Pope et al., 1996; McNally, 2007). Our data do neither support, nor contradict such position. Likewise, authors have criticized the way DSM-5 (APA, 2013) defines dissociative amnesia, particularly the basic assumption that intense distress precedes dissociative memory loss (Rivard et al., 2002). Our data do not allow us to question the DSM-5 (APA, 2013) criteria for dissociative amnesia. We do contend, however, that none of the 128 case studies in our set covered all of those criteria. Dissociative amnesia, as sketched in these case studies, appeared to be a rather elastic and open defined construct that described various types of memory loss, in the presence or absence of a broad range of psychosocial and

biological stressors, and without alternative explanations being ruled out. Thus, further descriptive research on the dissociative amnesia is certainly warranted and what is especially needed are case studies in which other interpretations are meticulously ruled out (e.g., ordinary forgetting, encoding failure, TGA, malingering). Arguably, it is not always possible to rule out all the alternative explanations for dissociative amnesia. Still, claims of dissociative memory loss should be tempered to the extent that it is impossible to exclude these alternative explanations. It is difficult to escape the conclusion that as a diagnostic label, dissociative amnesia is often prematurely used. Having said that, the burden of proof for dissociative amnesia falls on scholars who claim that it is a useful diagnostic category. Future case studies may well meet the high bar that the DSM-5 (APA, 2013) sets, but to date, none have done so convincingly.

In this respect, there are three further points that deserve comment. First, as stated before, authors of dissociative amnesia case reports often present relatively mild events as though they are somehow causally related to the memory loss. This type of interpretation is reminiscent of the ever-widening range of adverse events (e.g., marital disruption, affairs and divorce, employment-related and money issues, breaking up with friends) that is subsumed under the A ("trauma exposure") criterion of PTSD (e.g., Rosen, 2004; Rosen & Lilienfeld, 2008), thereby inflating the concept of trauma (see also Brewin et al., 2009). We have no strong opinions about whether or not mildly adverse events might elicit dissociative coping, but we do argue that case studies on dissociative amnesia could become more convincing if they would pay more attention to the dissociative element, namely by administering tests and interviews that gauge patients' habitual tendency to react with dissociative detachment to distressing events. Yet, even if future case studies on dissociative amnesia would more systematically cover dissociative features, the qualifier "dissociative" may still be problematic (Briere et al., 2005). The point here is that it may potentially refer to a broad range of phenomena, some of which are benign (e.g., absent-mindedness), whereas others are pathological (e.g., derealisation). Admittedly, scholars have tried to conceptualize these different phenomena as the manifestations of a limited number of underlying mechanisms (e.g., detachment versus compartmentalization; see Holmes et al., 2005), but the issue remains that there seems to be no unitary latent factor that one could reasonably refer to as "dissociative". Given the

multidimensionality of dissociative symptoms and the ensuing lack of consensus about their underlying mechanisms (e.g., Briere et al., 2005), it is not surprising that authors of dissociative amnesia case studies attribute different characteristics to what is assumed to be one and the same phenomenon (i.e., dissociative amnesia). For instance, whereas Lee and co-workers (2011) emphasize "functional dissociation of the fronto-temporal regions through the release of stress hormones" (p. 379, ibid), Staniloiu and colleagues (2018) relate dissociative tendencies to vegetative-emotional cognitive reactions, and Tramoni et al. (2008) speculate about a "double dissociation" between "preserved cognitive processing of emotion and altered experienced somatic arousal" (p. 15, ibid). Clearly, when scholars describing dissociative amnesia cannot find a common ground in what the term "dissociation" entails, one wonders why certain memory disturbances have to be labelled as dissociative in the first place. Thus, considering the intrinsically problematic nature of the qualifier "dissociative" and the difficulty to rule out other mechanisms (e.g., feigning), we recommend to employ neutral labels such as "*unexplained memory loss*" or "*amnesia of uncertain aetiology*" to describe individuals who present with what seems to be a non-organic form of extreme forgetting (see for a similar analysis, Brandt & Van Gorp, 2006).

Second, many case studies on dissociative amnesia cast the interpretational options of such cases in terms of a dichotomy: Organic versus dissociative or dissociative versus malingering. Kopelman (2000) suggested that these dichotomies might be false. That is, patients may develop memory loss due to brain injury, then later on react with dissociative detachment to the distress, and still eventually feign their memory impairments. Case studies on dissociative amnesia would gain in strength if they would take such dynamics into account. Third, neuro-imaging studies showing reduced prefrontal-temporal connectivity or a hypometabolic state of the right temporo-frontal region in patients with dissociative amnesia are certainly intriguing (Staniloiu & Markowitsch, 2014), but they illustrate at most a correlation, not causation. Whether reduced brain metabolism in certain areas is the organic vehicle of dissociative memory loss could be examined with transcranial magnetic stimulation techniques (e.g., Boggio et al., 2009).

Finally, authors presenting dissociative amnesia cases should provide readers with sufficient information regarding their patients' condition, anchoring their diagnosis as much as possible in DSM-5

(APA, 2013), specifically in terms of diagnostic criteria, associated features, and differential diagnoses. As just noted above, we are aware that some journals have words limits in place. However, at present, readers might be provided with available supplemental materials on online platforms (e.g., Open Science Framework). Equally, authors should consider possible alternative accounts for dissociative amnesia. Indeed, as our findings show, omitting or not reporting crucial information about dissociative amnesia patients (e.g., trauma) does not contribute to a fair understanding of this phenomenon. Rather, it may cast doubts on diagnostic coherence and prevalence of dissociative amnesia. We encourage reviewers of case study manuscripts on dissociative amnesia to critically look for falsifiable signs of dissociative amnesia accounts. For instance, reviewers and editors should challenge the authors regarding whether or not memory loss might be rather due to (1) undetected organic dysfunctions, (2) normal memory phenomena (e.g., ordinary forgetting, childhood amnesia, failure to encode the experience), and (3) malingering. Related to the latter, we further suggest that reviewers and editors should carefully investigate the circumstances in which reports of memory loss emerge, and perhaps ask for more details if needed.

In closing, we do not want to imply that dissociative amnesia is a non-existing diagnostic entity. Rather, our findings highlight that case study data surrounding the nature and aetiology of dissociative amnesia are unconvincing, lacking of convergence and cohesion across clinicians and academics. Taken together, we provide strong evidence that without proper examination that rules out differential diagnosis and alternative explanations, the diagnostic label of dissociative amnesia as currently known may be deceiving.

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Appendixes

Appendix 1. Full distribution of the patients' amnesic time period, and corresponding frequencies and percentages (*n* = 127) split by extended and circumscribed amnesic life-time periods.

Extended Life Time Period	Frequencies	%
Life-span	66	68.8
Recent and Remote Autobiographical Events during Adulthood	14	14.6
Functional anterograde amnesia	6	6.3
From Early Childhood to Remote Events during Adolescence	3	3.1
From Adolescence to Remote and Recent Autobiographical Events during Adulthood	2	2.1
From Remote Events during Adolescence to Recent Autobiographical Events	2	2.1
Life-span and Loss of Mother Language	2	2.1
From Remote Events during Adolescence to Remote Events during Adulthood	1	1
Total	96	100
Circumscribed Life Time Period		
Recent Autobiographical Events	23	72
Early Childhood Events	5	16.1
Remote Events during Adolescence	2	6.5
Remote Events during Adulthood	1	3.2
Total	31	100

Appendix 2. List of the tools and sources used to document the dissociative amnesia cases, and corresponding frequencies and percentages.

	Frequencies	**%**
Neuropsychological Tests and Neuroimaging	22	17.2
Neuropsychological Tests	21	16.4
Neuropsychological Tests, Neuroimaging, and Comparison to Control Group	19	14.8
Neuropsychological Tests and Comparison to Control Group	7	5.5
Neuropsychological Tests, Comparison to Control Group, and Referral Sources	7	5.5
Neuro-imaging	4	3.1
Neuropsychological Tests, Neuroimaging, and Collateral Sources	4	3.1
Neuropsychological Tests and Collateral Sources	3	2.3
Neuropsychological Tests, Comparison to Control Group, and Collateral Sources	3	2.3
Neuropsychological Tests, Neuroimaging, Referral, and Collateral Sources	3	2.3
Referral Sources	2	1.6
Test-retest	2	1.6
Collateral Sources	2	1.6
Neuropsychological Tests and Test-retest	2	1.6
Neuropsychological Tests and Referral Sources	2	1.6
Neuropsychological Tests, Neuroimaging, and Test-retest	2	1.6
Neuropsychological Tests, Neuroimaging, and Referral Sources	2	1.6
Neuropsychological Tests, Neuroimaging, Referral Sources, and Test-retest	2	1.6
Neuropsychological Tests, Neuroimaging, Comparison to Control Group, Referral Sources, Collateral Sources, and Test-retest	2	1.6
Neuropsychological Tests, Neuroimaging, Comparison to Control Group, and Test-retest	2	1.6
Neuropsychological Tests, Referral Sources, and Test-retest	1	.8
Neuropsychological Tests, Collateral Sources, and Test-retest	1	.8
Neuropsychological Tests, Neuroimaging, Comparison to Control Group, Collateral Sources, and Test-retest	1	.8
Information Absent	12	9.4
Total	128	100

Appendix 3. List of the main diagnostic features reported in support of dissociative amnesia, and corresponding frequencies and percentages divided by presence or absence of the psychological traumatic experience.

Presence of Traumatic Experience	Frequencies	%
Trauma, Type and Duration	53	55.2
Trauma, Type, Duration, and Functioning Impairment	14	14.6
Trauma, Type, Duration, Functioning Impairment, and Unawareness	8	8.3
Trauma, Type, Duration, and Unawareness	7	7.3
Trauma	3	3.1
Trauma and Type	3	3.1
Trauma, Type, Duration, Functioning Impairment, Unawareness, and Not Due to Substance, Neurological or Medical Condition	2	2.1
Trauma, Type, Duration, Functioning Impairment, and Not Due to Substance, Neurological or Medical Condition	2	2.1
Trauma, Type, Duration, Unawareness, and Not Due to Substance, Neurological or Medical Condition	1	1
Trauma, Type, and Functioning Impairment	1	1
Trauma, Duration, and Functioning Impairment	1	1
Trauma and Functioning Impairment	1	1
Total	96	100
Absence of Traumatic Experience		
Type and Duration	16	50
Type, Duration, Functioning Impairment, Unawareness, and Not Due to Substance, Neurological or Medical Condition	5	15.6
Type, Duration and Unawareness	3	9.4
Type, Duration and Functioning Impairment	1	3.1
Type, Duration, Functioning Impairment, and Unawareness	1	3.1
Type, Duration, Unawareness, and Not Due to Substance, Neurological or Medical Condition	1	3.1
Functioning Impairment	1	3.1
Not Due to Substance, Neurological or Medical Condition	1	3.1
Information Absent	3	9.4
Total	32	100

Appendix 4. List of the associated features reported in the articles, and corresponding frequencies and percentages.

	Frequencies	**%**
History of Trauma	11	8.6
Self-destructive Behaviors	8	6.3
History of Trauma and Self-destructive Behaviors	3	2.3
Dissociative Flashback	2	1.6
History of Trauma and Dissociative Flashback	2	1.6
History of Trauma, Self-destructive Behaviors, and Dissociative Flashback	1	.8
Information Absent	101	78.9
Total	128	100

Note: History of Trauma stands also for child abuse, victimization and repeated traumatic experiences; Self-destructive Behaviors includes also self-mutilation, suicide attempts and similar misconducts.

Appendix 5. Full distribution of the differential diagnosis carried out in the articles, and corresponding frequencies and percentages.

	Frequencies	**%**
Neurocognitive Disorders and Post-traumatic Amnesia due to Brain Injury	40	31.3
Neurocognitive Disorders	34	26.6
Neurocognitive Disorders and Substance-related Disorders	15	11.7
Post-traumatic Amnesia due to Brain Injury	4	3.1
Neurocognitive Disorders, Post-traumatic Amnesia due to Brain Injury, and Factitious Disorder	2	1.6
Neurocognitive Disorders, Post-traumatic Amnesia due to Brain Injury, Factitious Disorder, and Seizure Disorder	2	1.6
Neurocognitive Disorders, Post-traumatic Amnesia due to Brain Injury, and Substance-related Disorders	1	.8
Neurocognitive Disorders, Substance-related Disorders, and Factitious Disorder	1	.8
Neurocognitive Disorders and Factitious Disorder	1	.8
Substance-related Disorders	1	.8
Factitious Disorder	1	.8
Information Absent	26	20.3
Total	128	100