

Psychogenic amnesia: implications for the diachronic sense of selfhood

Amnésia psicogênica: implicações para o senso de si mesmo diacrônico

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Abstract: Traditionally, the issue of personal identity has been considered as the question about what makes one the same across time. Recently though, attention to one's own phenomenal experience has brought a new perspective to the debate. In light of this change of perspective, Klein suggests that individuals with retrograde episodic amnesia retain a notion of who they are, as well as a sense of continuity. He, therefore, argues that episodic memory is not necessary for a diachronic sense of selfhood. I challenge Klein's conclusion by pointing out that there are more extreme kinds of amnesia—e.g. psychogenic amnesia—that seem problematic to his proposal—according to which a sense of continuity is enough for a diachronic sense of self. This is the case because some instances of psychogenic amnesia are cases of dissociative amnesia, which show that having continuous conscious experience does not solve the issue.

Keywords: Episodic Memory; Diachronic Sense of Self; Dissociation

Resumo: Tradicionalmente, a questão da identidade pessoal é considerada a questão a respeito ao que faz uma pessoa ser a mesma ao longo do tempo. Recentemente, porém, atenção à experiência fenomênica trouxe uma nova perspectiva ao debate. À luz dessa mudança de perspectiva, Klein sugere que indivíduos com amnésia episódica retrógrada retêm uma noção de quem são, além de terem senso de continuidade. Ele, portanto, argumenta que a memória episódica não é necessária para se ter sensação de si mesmo diacrônica. Desafiamos a conclusão de Klein apontando que existem tipos mais extremos de amnésia—amnésia psicogênica—que parecem problemáticos à sua proposta de que o senso de continuidade é suficiente para se ter sensação de si mesmo diacrônico. Esse é o caso, porque alguns exemplos de amnésia psicogênica são casos de amnésia dissociativa, que mostram que ter uma experiência consciente contínua não resolve o problema.

Palavras-chaves: Memória Episódica; Sensação de Si Mesmo Diacrônico; Dissociação

Introduction

The problem involving personal identity has captured the attention of philosophers because we commonly tend to believe that we are the same throughout life. Furthermore, several important issues depend on personal identity; for instance, whether I care about my future, whether I take responsibility for my past actions, whether I re-identify the people I care about when I meet them at a future moment, among others. Traditionally the issue of personal identity has been framed, roughly, as the question about what makes one

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the same person across time. There have been several approaches to the issue, as well as a range of solutions. One of the views that have gained a fair amount of acceptance proposes psychological criteria to answer the question about what constitutes identity across time. Amongst the most cited criteria is episodic memory. Recently though, Klein¹ has focused on one's own phenomenal experience to answer questions about personal identity, switching the focus to *the sense of continuity*² instead of personal identity itself. In light of this change of perspective, Klein³ has suggested that individuals with retrograde episodic amnesia retain a notion of who they are; they have trait self-knowledge⁴ as well as a sense of continuity⁵. He, therefore, argues that episodic memory is not necessary for *the diachronic sense of self*, which can be understood as a sense of oneself as the same self at a different time. It is important to note that trait self-knowledge is distinct from remembering episodes from one's subjective past. Trait self-knowledge is the semantic knowledge about one's own character traits, while episodic memory is a representation of an episode from one's personal past, which encompasses a specific phenomenology. I disagree with Klein that simply knowing one's character traits, as well as having continuous awareness, is enough when it comes to personal identity issues. Thus, being aware of who one is requires more than trait self-knowledge; it requires at least being able to be aware of oneself in one's subjective past while being aware of it as one's own subjective past.

I challenge Klein's conclusion by pointing out that there are more extreme kinds of amnesia—e.g. psychogenic amnesia—that seem problematic for his proposal that a sense of continuity is enough for a diachronic sense of selfhood. Some instances of psychogenic amnesia are cases of dissociative amnesia, such as fugue, in which the subject seems to dissociate from all kinds of autobiographical information. Additionally, some psychogenic amnesia cases make the sense of continuity seem too frail to matter to what we care about in relation to the issue of personal identity. In order to advance this argument, in section one, I briefly review the issue of personal identity. In section two, I present some relevant points about recent theories of episodic memory, and I sketch my proposal for a diachronic sense of self. In section three, I present a case of psychogenic amnesia. In

¹ KLEIN, *Self and its brain*, 2012; KLEIN, *The sense of diachronic personal identity*, 2013.

² Klein (2013, p. 805) does not make clear what he means by *sense of continuity*. It is likely that he means the experience of being continuous. One must not confuse sense of continuity with “experience of continuity though time” (KLEIN, 2012, p. 481). Klein means something more substantial by the latter, “[t]he I experienced now is connected to the I experienced at previous points (as well as later points) in one's life” (2012, p. 805).

³ Ibid.

⁴ Trait self-knowledge is knowledge of one's own character traits.

⁵ For Klein, the combination of information about oneself, and continuous, unified first-person awareness is enough to supply the notion of who one is.

section four, I draw on this case to show its implications for Klein's proposal. In section five, I answer a possible objection.

Personal identity

The fundamental concepts discussed in the personal identity debate are *person*, *time*, and *identity*. These concepts appear in the philosophers' framing of the question and in their proposed solutions. Parfit⁶, for instance, frames the issue of personal identity in the following way: "[...] what it is that makes us now and ourselves next year the same people"⁷. Locke famously offered a solution to the problem. He claimed that "[...] as far as this consciousness can be extended backwards to any past action or thought, so far reaches the identity of that person; it is the same self now that it was then; and this present self that now reflects on it is the one by which that action was performed"⁸.

The fact that persons change throughout time is at the core of the issue of diachronic personal identity. If the question were whether S is identical to herself at moment T₁, then we would no longer be talking about diachronic personal identity. Things change when we start to think about the same self in two different moments in time, and questions concerning change are at the core of the diachronic personal identity issue. Therefore, time is an important element to personal identity because it is time that allows relevant change in psychological components to occur, change being the underlying problematic element of diachronic personal identity⁹.

Usually, the debate on diachronic personal identity can orbit a metaphysical or an epistemological approach to the issue. (i) The metaphysical approach focuses on what constitutes diachronic personal identity, and (ii) the epistemological approach focuses on the belief that a person A is now the same person as she was in the past, and its justification. Issue (i) is focused on the criteria for personal identity, and (ii) is more concerned about the evidence for belief in personal identity, or evidence that someone has diachronic personal identity.

The discussion has mostly focused on (i), on what has been called the psychological criteria for personal identity. Locke inaugurated this kind of solution. Often Locke's readers have interpreted him as proposing that memory—of the kind we would call episodic memory nowadays—is the criterion for personal identity. Whether memory is the

⁶ Parfit himself defended the claim that personal identity is not an important philosophical notion. He puts forth his own ideas of what is important.

⁷ PARFIT, *Reasons and Persons*, p. 200.

⁸ LOCKE, *An essay concerning human understanding* Book II, p. 115.

⁹ Although I do not put forward a definition of noticeable change, and I admit that it is a vague notion, I will assume that it is roughly clear when a change is noticeable, even if just to the changed person herself.

appropriate criterion is a point of debate by those who endorse psychological criteria; the proposal, nonetheless, has remained a strong contender in the debate.

I will not focus on these traditional aspects of the dispute. Klein¹⁰ has offered a fresh perspective of the debate by focusing on its phenomenal aspects, which, for instance, allow one to accept responsibility for past actions, and plan for the future. Klein's¹¹ proposal, however, questions Locke's episodic memory criterion. Klein claims two things. First, that individuals with extensive retrograde episodic amnesia—encompassing their whole lives, such as patient D.B.¹²—retain a notion of who they are. Second, that their continuous conscious experience is enough to claim that they have *a sense of continuity* in time. Being that the case, one can have knowledge about oneself based on sources other than episodic memory. Klein¹³ focuses, for instance, on the fact that D.B. preserved his trait self-knowledge. Therefore, episodic memory is dispensable for the sense of continuity. This proposal makes sense if one takes Klein to be suggesting that the sense of continuity is the best we can get, or that it suffices to answer the philosophical questions that usually surround personal identity. I disagree with Klein, but before I explain why, I will summarize his position.

I cannot do justice to Klein's view here, but given its ingenuity and influence, I will consider its main conclusions. Being aware “and now and now and now”¹⁴ is what he calls *the sense of personal synchronicity*, which depends on continuous conscious experience. Klein's proposal seems to presuppose that awareness from one moment to the next provides continuity of conscious experience, and considering that conscious experience is necessarily consciousness of *my* experience, it provides a sense of self that is synchronic (i.e., at the moment, as opposed to extended in time). Klein's proposal also aims at answering the question about whether D.B. and other patients with similar (or even more severe) limitations can be considered selves or persons. I have no problem agreeing with Klein that they are selves, and that sense of personal synchronicity is enough for being a self. I limit my discussion to the issue of diachronic personal identity; i.e., whether and how one can be aware of oneself as the same person that one was at past moments of time.

I do not deny that we have continuous conscious experience, or that it might provide a sense of continuity. I disagree, however, with Klein's proposal, because the sense of continuity does not seem to be the best we can get concerning the issue of diachronic

¹⁰ KLEIN, *Self and its brain*, 2012; KLEIN, *The sense of diachronic personal identity*, 2013.

¹¹ KLEIN, *The sense of diachronic personal identity*, 2013.

¹² D.B. was a patient who suffered from retrograde amnesia encompassing his whole life, as well as anterograde amnesia, while retaining part of his semantic memory.

¹³ Ibid.

¹⁴ Ibid., p. 808.

personal identity. A patient who suffers from dense retrograde amnesia¹⁵, for instance, could *conclude* that she is the same person as the one that she knows—based on semantic knowledge—from a story about her own past. Nonetheless, she cannot be *aware* of herself as the same person that she was in the past. She lacks the necessary kind of consciousness (autonoetic consciousness¹⁶, which is specific to episodic memory), and the phenomenal experience that accompanies it. Although she knows she is the same person, I claim that she cannot *feel* as the same person. The problem is that she lacks the phenomenology that accompanies autonoetic consciousness (see section two for clarification). Moreover, a sense of continuity does not address the related issues that make personal identity so important to us. I will argue that episodic memory is necessary for the diachronic sense of selfhood, and that Klein’s proposal does not address the crucial points of the issue.

Episodic memory

As mentioned above, Locke’s influential answer to the issue of diachronic personal identity focuses on episodic memory. Here, I accept recent theories of episodic memory that have proposed an innovative view of this cognitive system as part of a larger Mental Time Travel (MTT) system, which encompasses, for instance, imagination and counterfactual thinking¹⁷. Therefore, episodic memory is not part of a dedicated system for remembering. The proposal is that the MTT system is a system of hypothetical thought¹⁸ or simulation¹⁹.

Episodic memory is of interest to personal identity for additional reasons encompassing its phenomenological characteristics. It involves autonoetic consciousness, “consciousness of self in subjective time”²⁰, and chronesthesia, consciousness of subjective time²¹. These are the conscious elements that allow the person to be aware of herself, her actions, and experiences in different times. Tulving’s definition of episodic memory focuses on these elements to characterize it:

¹⁵ By dense retrograde amnesia, I mean that the patient cannot remember any episode of her life prior to the onset of the condition.

¹⁶ Autonoetic consciousness is associated to episodic memory. It is consciousness of self in one’s own subjective time (MICHAELIAN, 2016).

¹⁷ TULVING, *Episodic memory: From mind to brain*, 2002; SUDDENDORF; ADDIS; CORBALLIS, *Mental time travel and the shaping of the human mind*, 2009; SCHACTER; ADDIS, *The cognitive neuroscience of constructive memory: remembering the past and imagining the future*, 2007; DE BRIGARD, *Is memory for remembering? Recollection as a form of episodic hypothetical thinking*, 2014; MICHAELIAN, *Mental time travel: episodic memory and our knowledge of the personal past*, 2016; SANT’ANNA, *Mental time travel and the philosophy of memory*, 2018.

¹⁸ DE BRIGARD, *Is memory for remembering? Recollection as a form of episodic hypothetical thinking*, 2014.

¹⁹ MICHAELIAN, *Mental time travel: episodic memory and our knowledge of the personal past*, 2016.

²⁰ *Ibid.*, p. 117.

²¹ *Ibid.*

Episodic memory is a recently evolved, late-developing, and early-deteriorating past-oriented memory system, more vulnerable than other memory systems to neuronal dysfunction, and probably unique to humans. It makes possible mental time travel through subjective time, from the present to the past, thus allowing one to re-experience, through auto-noetic awareness, one's own previous experiences. Its operations require, but go beyond, the semantic memory system²².

This definition makes clear that auto-noesis and chronesthesia, the phenomenal elements of episodic memory, are crucial to it, because these elements allow mentally traveling in time to the recalled episode; also, they allow placing it in subjective time. Moreover, this kind of memory does not simply involve access to information about the episode; it is as if the subject experiences the episode, which highlights the phenomenal character of episodic memory.

In the taxonomy of memory, there is non-cognitive memory (e.g., procedural memory) and cognitive memory (e.g., declarative memory). Episodic memory is one of the varieties or memory of the cognitive type²³. It is distinguished mainly from semantic memory, the other variety of cognitive memory. While semantic memory refers to factual and conceptual information, such as that Paris is the capital of France or that H₂O is the molecular formula of water, episodic memory, as the name makes clear, is memory of episodes, specifically from one's own personal past. It is important to note that episodic memory is different from autobiographical memory—the kind of memory that includes both semantic memories of information about oneself, such as date of birth and trait self-knowledge, as well as one's own episodic memories. There are two varieties of autobiographical memory. On the one hand, there is episodic autobiographical memory (EAM). On the other hand, one can also have purely semantic autobiographical memory, which involves factual or conceptual information about oneself, but it is distinguished from episodic memory because it has no phenomenal aspects and no episodic character.

I propose that auto-noesis and chronesthesia are relevant to the Lockean criterion of personal identity. Taking Locke's claim in a literal sense, the consciousness of past actions and experiences constitutes diachronic personal identity, and this is what episodic memory allows one to do; it allows one to mentally travel in time to past actions and experiences. Auto-noesis and chronesthesia are forms of consciousness associated with the phenomenal aspect of episodic memory, which allow one to be conscious of one's experiences and actions, and to re-experience them in subjective time. Through mental time travel, one re-experiences the remembered event. Hence, I defend that episodic memory engenders the diachronic sense of self. When the person is conscious of herself as

²² TULVING, *Episodic memory: From mind to brain*, p. 05.

²³ MICHAELIAN, *Mental time travel: episodic memory and our knowledge of the personal past*, 2016.

the one who had a certain experience in the subjective past, she has a diachronic sense of self; i.e., a sense of herself at a time different from the objective time.

Stanisloiu, Markowitsche, and Brand²⁴ relate episodic memory to trait self-knowledge (knowledge of one's own character traits or personality). I mention this only as a tangential point because Klein seems to accept that trait self-knowledge might be relevant to what he calls the diachronic sense of self (see section four). If Stanisloiu, Markowitsche, and Brand are correct, however, episodic memory is important to the formation of trait self-knowledge. Although I will not develop this argument here, roughly, they accept that children²⁵ and adolescents seem to rely on episodic memory for self-evaluation, while adults rely on semantic memory. Therefore, adults suffering from amnesia may maintain some trait self-knowledge, even knowledge about the self in time²⁶, although they caution that sustaining personal identity probably requires periodic updating that depends on episodic memory. On the other hand, Klein and Gangi²⁷ seem to disagree. They claim that semantic memory is enough to maintain trait self-knowledge. I will not take sides on this dispute; I will focus on a specific kind of amnesia to illuminate my disagreement with Klein.

Psychogenic amnesia

Psychogenic amnesia (also called dissociative or functional amnesia)²⁸ provides a reason to think that episodic memory is fundamental to the diachronic sense of selfhood. Before I concentrate on a case that supports this claim, it is necessary to explain what this memory impairment is. Psychogenic amnesia is a broad term used to describe a problem or condition related to episodic amnesia, mostly retrograde (but it can also be anterograde), which differs from the usual use of the term amnesia in the sense that it occurs without identifiable brain damage²⁹. This kind of memory retrieval blockage can impair one's ability to access episodic memory as well as autobiographical semantic memory, and, in some cases trait self-knowledge.

²⁴ STANILOIU; MARKOWITSCH; BRAND, *Psychogenic amnesia – A malady of the constricted self*, 2010.

²⁵ Although episodic memory is late developing, children of a certain age (at least older than 4 years of age) are capable of having episodic memory (TULVING, 2002)

²⁶ Self-knowledge is semantic information, and it includes both semantic autobiographical information and trait knowledge about one's personality traits. It is important to note that episodic memory is also autobiographical, but episodic memory has aspects that are experienced by the subject who remembers.

²⁷ KLEIN; GANGI, *The multiplicity of self: neuropsychological evidence and its implications for the self as a construct in psychological research*, 2010.

²⁸ There are other dissociative disorders aside from dissociative amnesia. This kind of disorder is characterized by the separation of functions of memory, identity, perception, or consciousness, which are normally well-integrated (REINHOLD and MARKOWITSCH, 2009, p. 2199).

²⁹ STANILOIU; MARKOWITSCH, *The remains of the day in dissociative amnesia*, p. 103.

Despite the fact that a lack of identifiable brain damage characterizes psychogenic amnesia, some experiments have been conducted to investigate a possible neuronal correlation to this kind of impairment³⁰. Brand et al. used fluorodeoxyglucose-positron emission tomography (FDG-PET) in order to investigate the neural correlates of this condition. When the regional glucose utilization between patients and control was compared, it revealed “a metabolic reduction in the right inferolateral prefrontal cortex”³¹ in relation to the control group. The researchers conclude that “[...] deficits in patients with dissociative amnesia are related to stress-associated dysfunctions in the inferolateral prefrontal section rather than to active and motivated forgetting of memories”³². Therefore, although it is a psychogenic kind of amnesia, investigation about this condition does not rely solely on the patients’ reports. Neurocognitive investigation can contribute to understanding these reports, as it will be seen in the case of N.N..

The severe consequences of psychogenic amnesia to the patients, and its association to what has been considered the loss of personal identity, has led to a discussion about the relevance of episodic memory and some of its key phenomenal and emotional elements for one’s identity. Reinhold and Markowitsch³³ highlight the importance of episodic and semantic autobiographical memories to identity, or personality.

Next to subjective time and auto-noetic consciousness the experiencing self amounts to the concept of episodic memory. Building up autobiographical memories enables us to experience our self as an entity over time and therefore enables the formation of an identity or “personality.” Our personality relies on past experiences, is strongly associated with our personal beliefs and allows us to consistently behave with our own beliefs and desires. The experiencing self assures the autobiographical memory to be a continuous memory system that is built up along a subjective time line [...]. Although the term ‘experiencing self’ can also be used to name the ‘rememberer’, the concept of the experiencing self implies the perceptual component of remembering a specific event from one’s own biography with contextual information like time, space, emotional state. However, the experiencing self has to be distinguished from the concept of the self as the self constitutes a multidimensional (moral, physical, personal, social, etc.)

³⁰ BRAND; EGGERS; REINHOLD; FUJIWARA; KESSLER; HEISS; MARKOWITSCH, *Functional brain imaging in 14 patients with dissociative amnesia reveals right inferolateral prefrontal hypometabolism*, 2009; STANILOIU; MARKOWITSCH; KORDON, *Psychological causes of autobiographical amnesia: A study of 28 cases*, 2018.

³¹ BRAND; EGGERS; REINHOLD; FUJIWARA; KESSLER; HEISS; MARKOWITSCH, *Functional brain imaging in 14 patients with dissociative amnesia reveals right inferolateral prefrontal hypometabolism*, p. 36.

³² Ibid., p. 37.

³³ REINHOLD; MARKOWITSCH, *Retrograde episodic memory and emotion: A perspective from patients with dissociative amnesia*, 2009.

and outlasting construct, while the experiencing self refers to a momentaneous state³⁴.

Reinhold and Markowitsch emphasize that the concept of experiencing self is also important to episodic memory. This concept highlights the perceptual component of remembering, which involves temporal information. Additionally, the ability to remember past experiences allows the formation of identity. This suggests that what the authors are calling *identity*³⁵ or *personality* (I call it *character traits*) depends, at least partially, on episodic memory because auto-noetic consciousness and chronesthesia allow one to experience oneself in different moments in subjective time, thus enabling the construction of a so-called identity. This is in agreement with Staniloiu, Markowitsche, and Brand's claims, briefly discussed in the previous section. Reinhold and Markowitsch³⁶ advance that identity relies on experiences along time, and on what one eventually knows about oneself based on these experiences.

Reinhold and Markowitsch also point out that together with auto-noetic consciousness and chronesthesia, they consider the *experiencing self* a relevant element for episodic memory, but it should not be confused with the self, which has several dimensions. The experiencing self, according to them, is a perceptual component specific to remembering, it is the perception of the remembered autobiographical event in the context of the time, space, and emotional state during the remembered event. It emphasizes the importance of one's experience of the recalled event in a way that it is re-experienced, in the sense that one re-experiences it in its context, temporal and spatial elements, as well as emotional content. Additionally, in episodic memory, the self that remembers the episode is experienced as the same that lived the episode.

Staniloiu, Markowitsch, and Brand³⁷ espouse a similar view. They claim that episodic memory integrates personal events and emotions with the auto-noetic self. Episodic autobiographical memory (EAM) is affectively laden, which is suggested by the fact that EAM engages networks associated with cognition and emotion, such as the right temporal-frontal areas and right amygdala. These views are aligned with what has been said about episodic memory in the previous section—which means that EAM also involves auto-noesis and chronesthesia. Therefore, research about psychogenic amnesia seems to take into consideration the recent MTT theories about episodic memory. If the abovementioned is correct, episodic memory impairments have a significant impact on

³⁴ REINHOLD; MARKOWITSCH, *Retrograde episodic memory and emotion: A perspective from patients with dissociative amnesia*, p. 2199.

³⁵ It is important not to confuse identity with personal identity. By identity, the authors seem to mean one's character traits.

³⁶ Ibid.

³⁷ STANILOIU; MARKOWITSCH; BRAND, *Psychogenic amnesia – A malady of the constricted self*, p. 785.

patients who suffer from psychogenic amnesia. I will focus on a few kinds of cases to show the relevance of episodic memory to the diachronic sense of self.

Dissociative fugue is a type of psychogenic amnesia which Staniloiu and Markowitsch³⁸ characterize as retrograde dissociative amnesia accompanied by sudden departure from usual environment and compromised personal identity³⁹. In these cases, it seems that access to the patient's past is blocked, resulting in what they call loss of personal identity⁴⁰. A patient in this condition is unaware of any information about herself and has no episodic memory of her past. Patients suffering from severe psychogenic amnesia, such as fugue cases, do not know anything about themselves, not even their names or addresses. They also do not express recognition when doctors or family members provide information about them. There are cases in which patients with severe psychogenic amnesia do not recognize their home or family. Patient N.N. exemplifies such a case. He did not express recognition or any connection to his past self, i.e. the self that he was before the fugue episode. To my knowledge, it was never asked to him whether or not he felt that he was the same person that he was before the fugue episode. Notwithstanding this fact, I dare say that after the fugue episode he did not feel as if he was the same person that the pre-fugue N.N. was—the person who he came to know through the descriptions provided by his family. It is worth detailing this example.

One day N.N. went to the bakery, and on his way suffered an episode of fugue. Consequently, he rode his bike through a few cities until he finally stopped in one of them, unaware of where he was or of any information about himself. When reunited to his family, N.N. did not recognize his wife or children. After the episode, he changed his habits—e.g., before the fugue episode he was an avid driver, but after he no longer liked driving—he also gained weight, and no longer had allergies. Given these facts, N.N.'s case is consistent with the diagnosis of psychogenic amnesia. For instance, Staniloiu and Markowitsch⁴¹ claim that patients suffering from psychogenic amnesia exhibit a change in personality (affectivity, behavior, perception, social cognition)⁴².

³⁸ STANILOIU; MARKOWITSCH, *The remains of the day in dissociative amnesia*, 2012.

³⁹ They do not clarify what they mean by personal identity, so I assume they mean what in general is meant by it: the belief that person A' at t_2 is the same as person A at t_1 .

⁴⁰ Other kinds of retrograde psychogenic amnesia also involve loss of personal identity.

⁴¹ STANILOIU; MARKOWITSCH, *Long lasting personality changes after the onset of dissociative amnesia*, 2013.

⁴² Considering the elements that Klein (2013) claims provide self-knowledge, it seems that Klein would attribute self-knowledge to N.N. because the elements include, for instance, sense of continuity, sense of agency and the ability to self-reflect. The latter two, however, do not seem important to questions about diachronic personal identity, because they do not involve knowledge or awareness of self in time, neither do they offer autobiographical information. Sense of continuity may imply a temporal notion, but in section five, I defend that continuous awareness is not enough to handle the problem of personal identity. The relevant self-knowledge must involve either temporal or autobiographical information.

N.N. eventually re-learned (semantically) his autobiographical information (taught by his family), but in what Staniloiu and Markowitsch⁴³ describe as *an unaffected manner*. I assume he re-learned about his previous personality traits when he went back to living with his family, and that everyday cohabiting probably brought up conversations about how he was and about his habits, for instance, “his family told him he had been a better cook before his fugue”⁴⁴. The unaffected manner in which he re-learned the information leads to the belief that N.N. did not recuperate his episodic memories, for usually this kind of memory is emotionally laden. He only remembered the information semantically. If we consider that auto-noetic consciousness is necessary for awareness of self in other times, then we must conclude that N.N. knows but does not sense (or feel) he is the person in the semantic autobiographical information, because semantic memory lacks auto-noesis. The problem involves a lack of phenomenology. He may know that a story about his past is about himself, but he does not *feel* auto-noetically what he knows; i.e., notwithstanding the fact that he has diachronic self-knowledge, he has no diachronic *sense* of self.

Further evidence corroborates the interpretation that N.N. did not recuperate his pre-fugue episodic memories:

N.N. was tested neuropsychologically and with functional imaging. Water-PET was used in combination with the design of Fink *et al.* [...], during which the patient was confronted with events from his personal past. While the normal probands had predominantly right temporo-frontal activation [...], N.N. had a left-hemispheric activation of these regions. In light of other data on brain activations during memory retrieval [...], this finding was interpreted as suggesting that the patient perceived his own episodic-autobiographical episodes as if they were belonging to a third, neutral person⁴⁵.

On the one hand, controls mostly show right temporal-frontal activation when presented with autobiographic episodic information, associated to episodic memory. On the other hand, N.N. presents activation associated with semantic memory. I agree with the authors that the result suggests that N.N.’s memories are not episodic memories. This is the case because episodic memory encompasses auto-noetic consciousness. The description of a memory as information that could be third-person information fits better with semantic memory, “[t]hat is, N.N. seems to process all incoming information in a neutral, ‘semantic’ manner”⁴⁶.

⁴³ STANILOIU; MARKOWITSCH, *The remains of the day in dissociative amnesia*, 2012.

⁴⁴ MARKOWITSCH; FINK; THONE; KESSLER; HEISS, *A PET study of persistent psychogenic amnesia covering the whole life span*, p. 146.

⁴⁵ STANILOIU; MARKOWITSCH, *The remains of the day in dissociative amnesia*, p. 118-119.

⁴⁶ MARKOWITSCH; FINK; THONE; KESSLER; HEISS, *A PET study of persistent psychogenic amnesia covering the whole life span*, p. 152.

If this is correct, then N.N. recalls only semantically his re-learned autobiographic information. Thus, he does not have auto-noetic consciousness—consciousness of himself in subjective time—in the recollection of these episodes; i.e., he does not mentally travel in subjective time to simulate a past episode. One may conclude that he simply retrieves the semantic information about the episode that he re-learned after the onset of his condition. Considering the change in personality, I assume he also lacks pre-fugue trait self-knowledge, but may have re-learned some of those traits from what his family tells him about himself. Semantic information retrieval, however, is third-person information, such as recalling a story a friend told of a trip she took to Washington, D.C. In this kind of situation, one does not re-experience the trip when one retrieves the information because one does not have auto-noetic consciousness of the episode. These phenomenal aspects of episodic memory are not present in semantic memory. Thus, one can retrieve the semantic information, but one cannot re-experience the episode. Thus, N.N. regained information that contributed to his pre-fugue self-knowledge, but if we accept that these are to him as third-person information, then the dissociation persists; he cannot access the information in a self-aware way.

N.N.'s case is significant because it provides an example of loss of episodic autobiographical memory (EAM) due to the loss of episodic memory that is documented by neurophysiological information. Additionally, before he re-learned it, N.N. also suffered the loss of autobiographic semantic information. Thus, it provides evidence to the discussion of what this kind of cognitive loss means to my proposal of a diachronic sense of self. After the fugue episode, and before he re-learned his semantic autobiographical information, with the condition of a concomitant loss of autobiographic episodic memory, can it be said that N.N.'s sense of diachronic personal identity remains the same as before the fugue episode? If one agrees that N.N. went through a dissociation episode, the dissociation from autobiographical memory is considered as such because it constitutes a dissociation from his identity. This brings up the question of whether it is possible for him to still have a diachronic sense of self.

In cases in which psychogenic amnesia encompasses loss of episodic memory (retrograde amnesia), and of semantic autobiographic memory, psychogenic amnesia is a dissociation of core elements of self-knowledge. Psychogenic amnesia is a type of dissociation of autobiographical memory, and it has been argued that it affects other self-related functions and emotional processing⁴⁷. One cannot be aware of oneself in subjective time if auto-noetic consciousness is impaired. This suggests that, when patients suffering from this kind of amnesia dissociate from their self-knowledge (information about themselves and about their personality traits) and from their episodic memory, they no

⁴⁷ STANILOIU; MARKOWITSCH; BRAND, *Psychogenic amnesia – A malady of the constricted self*, 2010.

longer can have a diachronic sense of self. This is the case because they can no longer mentally travel in time, which provides the sense of their own temporal extension.

From the abovementioned, one can conclude that N.N. is not aware of himself at different times; as a result, he does not satisfy the requirement for my proposal of a diachronic sense of self. After he re-learns his autobiographical information, he has knowledge about his life and his personality, but only in the same way he may know who Chelsea Manning is, for example. He does not feel it. N.N. is not aware of himself as the same person of the episodes of his past that he re-learned semantically.

It is important to note that N.N.'s case is distinct from cases of dense (non-psychogenic) amnesia, such as the cases of patients D.B. or B.. Patient D.B. had retrograde amnesia encompassing his whole life, as well as anterograde amnesia. Although D.B. had gaps in his semantic knowledge about himself, he, nevertheless, knew various facts about his life and he preserved his trait self-knowledge⁴⁸. Hence, N.N.'s memory impairment is more profound, because it affects his episodic memory and his personality traits. In fact, Klein seems to be unaware of the existence of such a severe impairment, "my colleagues and I have yet to find a patient who could not reliably and accurately report his or her trait self-knowledge"⁴⁹. Patient B. had impaired short-term memory. After a gas poisoning accident, he could not remember anything that happened over 1 second before. B. also suffered from anterograde amnesia, but not retrograde amnesia prior to the relevant accident. Although his memory impairments were dramatic, B. preserved his episodic memory from before the accident, differently from N.N.. There is also no mention of B. not knowing his character traits, so I assume his trait self-knowledge was not impaired.

Klein supposes that these kinds of episodic memory impairments are enough to show that one does not need episodic memory to have diachronic sense of self, but B. relies on episodic memory from prior to his accident for such. I disagree that D.B. has a diachronic sense of self. He may have what Klein calls a sense of personal synchronicity; nevertheless, I do not think this sense is relevant to issues that make us care about personal identity (see section four for a defense of this point).

N.N. is not alone in exhibiting psychogenic amnesia. Although this is a rare condition, several other patients have been studied⁵⁰. Patient D.F.⁵¹ is not characterized as a fugue case. She was on a trip in China, when she was found one evening unconscious and undressed. She was examined at the hospital, but no harm was found to her body, except for a small bump on her forehead. FDG-PET and magnetic resonance imaging (MRI)

⁴⁸ KLEIN, *Self and its brain*, 2012.

⁴⁹ KLEIN, *The sense of diachronic personal identity*, p. 799.

⁵⁰ STANILOIU; MARKOWITSCH; KORDON, *Psychological causes of autobiographical amnesia: A study of 28 cases*, 2018.

⁵¹ REINHOLD; MARKOWITSCH, *Retrograde episodic memory and emotion: A perspective from patients with dissociative amnesia*, 2009.

revealed no abnormality. Nevertheless, D.F. exhibited dense retrograde amnesia and she could not remember semantic autobiographical information, such as her name or address. When she went home, she could not recognize her parents. Her ability to form new memories, however, was not compromised, so Reinhold and Markowitsch claim she was able to build a new identity⁵². N.N. and D.F. show that loss of semantic self-knowledge—as well as episodic memory—results in dissociation from autobiographical information. This may be the case, because episodic memory, and autobiographical information in general, contribute to the formation of self-knowledge.

Staniloiu, Markowitsch, and Kordon describe four cases of fugue, patients D, R, H and K. “All four patients did not regain conscious, first person access to their past, but were able to relearn their past”⁵³. Although some patients suffered from *la belle indifférence*⁵⁴, not all of them were unconcerned about their condition. D.F., for instance, felt guilty for not recognizing her own parents. Staniloiu, Markowitsch, and Kordon report that “a substantial number of the patients has somatic complaints and is eager to obtain advice on health issues”⁵⁵. While thirteen of the tested patients with various kinds of psychogenic amnesia exhibited emotional bluntness, fourteen tested normal on the emotional assessment. Ten of these patients suffered from retrograde amnesia encompassing their whole lives (patients D, E, F, M, N, O, S, T, V, and X).

It may be said that N.N.’s condition cannot make a case for the necessity of episodic memory for diachronic sense of self because N.N.’s impairments seem to encompass more than episodic memory. This may be the case. Nonetheless, episodic memory was N.N.’s most affected and permanently impaired cognitive function, considering that he was able to reacquire semantic information that he had lost. The reacquisition of self-knowledge, though, did not seem to make a difference to his condition; for this reason, the case suggests that episodic memory plays a relevant role in diachronic sense of self.

What does it all mean?

Klein defends that episodic memory is not necessary in order for a person to have a diachronic sense of self, because retrograde amnesiacs who lose episodic memory of their whole lives exhibit diachronic sense of self. According to him, this is due to the fact that they retain at least some self-knowledge, trait self-knowledge, which is a subsystem of the

⁵² They do not clarify what they mean by identity, but one can infer they mean that she had new autobiographical information and information about her personality traits, engendered by the episodic memories of her life after the dissociative incident.

⁵³ STANILOIU; MARKOWITSCH; KORDON, *Psychological causes of autobiographical amnesia: A study of 28 cases*, p. 143.

⁵⁴ Indifference about their own memory impairments.

⁵⁵ STANILOIU; MARKOWITSCH; KORDON, *Psychological causes of autobiographical amnesia: A study of 28 cases*, p. 141-142.

semantic memory system “that stores information about one’s personality in the form of trait generalizations”⁵⁶. Trait self-knowledge would allow an individual with retrograde amnesia to retain a sense of self, based on her dispositions, manifested in behavior in various past episodes. This type of self-knowledge is different from autobiographical semantic memory (factual semantic self-knowledge), which provides information about self, such as date and place of birth. Therefore, this would mean that knowing one’s own traits or personality is enough for one to have a diachronic sense of self⁵⁷. I assume that what Klein means by diachronic sense of self is slightly different from how I have been using the term; he means a sense of oneself extended in time, while I simply mean a sense of oneself at a different time.

This is an odd conclusion for Klein, though. He makes such a clear-cut difference between what he calls the epistemological self and the ontological self. Although I do not adopt Klein’s metaphysics, if I understand correctly, the epistemological self is associated with neuro-cognitive information, and the ontological self is associated with first-person subjective/phenomenal experience. Hence, it would be out of line with this distinction to conclude that semantic information is enough to engender a sense that is characterized by its phenomenology; the diachronic sense of self. One would expect that in Klein’s theoretical framework a diachronic sense of self would require phenomenal subjective experience—i.e. the unity of consciousness. This is why I assume that a more reasonable interpretation is that Klein means that the diachronic sense of self springs from trait self-knowledge in addition to continuous consciousness experience. The latter depends on the phenomenal unity of consciousness (what Klein would call ontological self): “[w]e all have direct acquaintance with a self, the apparent source of the phenomenal unity of our perceptual and introspective experiences”⁵⁸. Conscious experience is also important for Klein because he claims that it supplies the sense of personal synchronicity⁵⁹.

If I am correct, N.N. contradicts this conclusion. One must keep in mind that N.N. eventually re-learned semantic information about himself, but the facts re-learned did not seem to have provided him with an auto-noetic diachronic sense of self related to his pre-fugue existence (a sense of himself extended in pre-fugue subjective time). N.N. did not manifest diachronic sense of selfhood in his actions, in his general outlook, or in his feelings towards people around him. He, for instance, did not go back to his pre-fugue habits, and he considered his family strangers, while preferring he was still in the company

⁵⁶ KLEIN, *The sense of diachronic personal identity*, p. 797.

⁵⁷ *Ibid.*, p. 797.

⁵⁸ KLEIN, *Self and its brain*, p. 475.

⁵⁹ KLEIN, *The sense of diachronic personal identity*, p. 808.

of fellow patients at the psychiatric ward where he stayed for some time after his fugue episode⁶⁰. Trait self-knowledge, thus, is not sufficient for a diachronic sense of self.

Finally, Klein concludes that “diachronicity is not really sensed at all”⁶¹. He seems to conclude this from his argument that conscious experience provides a sense of personal synchronicity, which is ageless. Moreover, a sense of personal synchronicity would allegedly be enough to settle issues of personal identity (and related issues). I assume Klein means that, considering that conscious awareness is timeless—i.e., it involves no reference to time—, there cannot be a diachronic sense of self in cases such as the case of N.N. Roughly stated, Klein’s proposal is that a sense of personal synchronicity, based on continuous conscious experience, settles the debate.

I would like to stress that the interesting point about N.N. is that re-learning semantic autobiographical information about his life did not do much to bring him closer to being his pre-fugue self. He did not go back to his old habits, he still missed the people he met at the psychiatric ward, and he felt closer to them than he did to his family⁶². As patient D.F., he seems to have formed a new identity. The point is that, according to Klein’s theory, N.N. may have preserved a sense of personal synchronicity, and for the sake of argument, I will grant that he did. Nevertheless, it does not seem relevant to what makes personal identity important to us. When humans feel that they are continuous or extended in time, they do not mean only that they are continuously conscious. Most people would probably not accept that conscious continuity is enough, even if one changes drastically and has no memory or information about oneself. Klein’s sense of personal synchronicity would guarantee at the most that N.N., for instance, senses he existed a moment ago, considering that it is described as awareness of “and now and now and now”⁶³. For Klein’s proposal to maintain relevance, there must be some sense in which the person senses herself *as herself* at different times.

I suspect that if Klein’s sense of personal synchronicity were to be relevant to personal identity issues, it would have to smuggle in tacitly more than continuous conscious experience. Continuous conscious experience is *someone’s* continuous conscious experience. Tacitly, there is the assumption that conscious experience is integrated with other aspects of self. When this integration does not happen, the result is dissociation, such as N.N. exemplifies. This is why Klein’s proposal that a diachronic sense of self encompasses trait self-knowledge seems a feasible proposal at first. However, N.N.’s re-

⁶⁰ MARKOWITSCH; FINK; THONE; KESSLER; HEISS, A PET study of persistent psychogenic amnesia covering the whole life span, 1997.

⁶¹ KLEIN, *The sense of diachronic personal identity*, p. 808.

⁶² MARKOWITSCH; FINK; THONE; KESSLER; HEISS, A PET study of persistent psychogenic amnesia covering the whole life span, 1997.

⁶³ KLEIN, *The sense of diachronic personal identity*, 808.

acquisition of self-knowledge shows that self-knowledge is not sufficient for a diachronic sense of self, even if a continuous conscious experience accompanies it.

If I am correct, psychogenic amnesia cases show that episodic memory is necessary for the sense of personal identity. What does this mean for Klein's proposal? I consider N.N. a problematic case for Klein's proposal of a sense of personal synchronicity as a sufficient condition for continuous selfhood because, as far as we know, N.N. was continuously aware during his dissociation episode and after that. According to Klein's theory, he would have to say that N.N. has a sense of personal synchronicity. That's plausible, and even consistent with the available information about N.N.'s case. Going back to the facts, N.N. went to the bakery, had a fugue episode, and instead of returning home, he kept biking for five days, crossing a few cities.

In a city about 200 miles south of his home, he stopped and asked himself: "Why are you riding a bike here? Where do you want to go to? Where do you come from? Who are you?" He did not know what he looked like and so he viewed his reflection in a store window and was surprised to see what he looked like⁶⁴.

Considering that he was supposedly aware of himself the whole time (except for when he was asleep), Klein's proposal applies. However, can we say in any meaningful way that N.N. had even a sense of continuity? It is clear that he had no diachronic sense of self, considering either Klein's proposal or my proposal; i.e., N.N. did not have either a sense of himself at a past time or a sense of himself as a self extended in time. A sense of continuity in this case may be a point of dispute, but what N.N.'s case seems to signal is that, in typical cases, awareness is not just awareness; it is *my awareness*. To N.N. the *my* of awareness was emptied by dissociation. In fact, this is precisely why it is a case of dissociation.

The same cannot be said of episodic memory. Had N.N. been able to recall an episode of his subjective past, he would experience himself as the subject of the experience. Episodic memory, through auto-noesis, is an experience of self in an episode in subjective time. Therefore, *my* episodic memory is not devoid of content—the auto-noetic consciousness involved in it allows experiencing *my* remembering as an experience of the self. Episodic remembering is mine exactly in the sense that, when I recall an episode of the subjective past, the subject of that experience is the same as me. This provides a diachronic sense of self in a way that is relevant to issues surrounding personal identity.

Furthermore, would we not say that someone who remembers the day they started college or a fun moment during a trip has a diachronic sense of self regarding that memory? Episodic memories provide a pre-reflective sense of self, set in a different time

⁶⁴ MARKOWITSCH; FINK; THONE; KESSLER; HEISS, A PET study of persistent psychogenic amnesia covering the whole life span, p. 137.

from the present, which is the diachronic sense of self. (It is pre-reflective because one does not reflect about it being oneself in that memory. Auto-noetic consciousness implies that my memory is an experience belonging to self, placed in subjective time.)

Circularity

A famous objection to the memory criterion for personal identity is circularity⁶⁵. According to this line of objection, episodic memory cannot constitute personal identity, because it already presupposes personal identity. Episodic memory is necessarily *my* memory; i.e., its definition encompasses the notion of self. Hence, it is circular to claim that personal identity (self-identity) depends on episodic memory⁶⁶. The question then is whether the same objection applies to episodic memory as the criterion for diachronic sense of self. I will offer two conceivable answers to this possible objection.

When it comes to episodic memory as a criterion for a diachronic sense of selfhood, the problem of circularity is evaded because episodic memory does not depend on a sense of selfhood; it engenders it. It is possible to think about having episodic memories without having a sense of a self. A theory that proposes that there is no self, but just a succession of mental states (this is a simplification of Hume's view on the matter of personal identity) would claim that there is no self to engender a sense of self. A theorist who defends some version of this idea will probably have to grant that, even if the theory is correct, auto-noetic consciousness provides a sense that these memories are mine⁶⁷. A thin one, for sure, but still a sense of it being *my* memory, a weak sense of self. This sense of self springs from and is dependent on episodic memory; it is not presupposed in the memory. I will consider that it is not a controversial point that episodic memories feel like they are mine, or put it differently, that episodic memories encompass a sense of a or one's own self. Furthermore, the recognition of the occurrence of chronesthesia and auto-noetic consciousness in episodic remembering enables us to see how episodic memory engenders a diachronic sense of self.

Another alternative to answer the circularity objection considers dissociative disorders, which suggest that a memory may not be owned; i.e., the idea that it may lack *mineness*. This may be the case in dissociation identity disorder, in which an alter personality (or more than one) allegedly is created as a defense to trauma. The alter personalities protect the conscious self by disowning memories that the person has trouble handling at the time⁶⁸. They hold the troubling memories and experiences, "so that what is

⁶⁵ BUTLER, *The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*, 1842.

⁶⁶ KLEIN, *Self and its brain*, 2012.

⁶⁷ I thank Joshua Turkewitz for pointing this out to me in a conversation about the circularity objection.

⁶⁸ BRENNER, *Deconstructing DID*, p. 346.

disowned or ‘not-me’ is attributed to her ‘inside people’ instead”⁶⁹. The memories are personified in the alter personality. Thus, even if one does not subscribe to the idea that there are no selves, there is reason to believe that the present proposal evades the circularity objection because there may be episodic memory without the attribution of the remembering to a self, i.e., without encompassing a sense of self. However, it is important to note that in this kind of disorder the disowned episodic memories seem to be relevant to the creation of alter personalities. The memories may be disowned by the person suffering of the disorder, but they are still owned by the alter personality. One may conclude that after all episodic memories must encompass a sense of mineness and that the first response to the circularity objection is more suitable.

Conclusion

This investigation has focused on answering new challenges to the episodic memory criterion for personal identity put forward by Klein’s claim that individuals who suffer from extensive retrograde episodic amnesia still have a sense of continuity. I have argued that the sense of continuity, as Klein conceives it, does not add much to the issue of personal identity or related issues that elicit philosophical concern. Moreover, the relevant sense of selfhood to these issues is diachronic sense of self, which depends on episodic memory.

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References

- BRAND, Matthias; EGGERS, Carsten; REINHOLD, Nadine; FUJIWARA, Esther; KESSLER, Josef; HEISS, Wolf-Dieter; MARKOWITSCH, Hans J. Functional brain imaging in 14 patients with dissociative amnesia reveals right inferolateral prefrontal hypometabolism. *Psychiatry Research: Neuroimaging*, v. 174, p. 32-39, 2009.
- BRENNER, Ira. Deconstructing DID. *American Journal of Psychotherapy*, v. 53, n. 3, p. 344-360, 1999.

⁶⁹ Ibid., p. 352-353.

BUTLER, J. *The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*. London: James, John, and Paul Knapton. Reprinted New York: Robert Carter, 1736 [1842]. Available via <https://archive.org/details/worksofrightreve00butl/page/n305>. Retrieved 02 Sep, 2019.

DE BRIGARD, Felipe. Is memory for remembering? Recollection as a form of episodic hypothetical thinking. *Synthese*, v. 191, n. 2, p. 155-185, 2014.

HUME, David. *A treatise of human nature*, Book I. L. Ed. A. Selby-Bigge. Oxford: Clarendon Press, 1896[1739].

KEAN, Clara. Silencing the self: Schizophrenia as a self-disturbance. *Schizophr Bull*, v. 35, n. 06, p. 1034–1036, 2009.

KLEIN, Stanley. Self and its brain. *Social Cognition*, v. 30, n. 4, p. 474-518, 2012.

KLEIN, Stanley. The sense of diachronic personal identity. *Phenomenology and the Cognitive Sciences*, v. 12, n. 4, p. 791-811, 2013.

KLEIN, Stanley; GANGI, Cynthia E. The multiplicity of self: neuropsychological evidence and its implications for the self as a construct in psychological research. *Annals of The New York Academy of Sciences*, v. 1191, p. 1-15, 2010.

KLEIN, Stanley.; NICHOLS, Shaun. Memory and the sense of personal identity. *Mind*, v. 121, n. 483, p. 677-702, 2012.

LOCKE, John. *An essay concerning human understanding Book II: Ideas* (J. Bennett ed.). 2017. Available via <https://www.earlymoderntexts.com/assets/pdfs/locke1690book2.pdf>. Retrieved 14 Aug 2018. (Original work published 1689)

MARKOWITSCH, Hans J.; FINK, Georg R.; THONE, Angelika; KESSLER, Josef; HEISS, Wolf-Dieter. A PET study of persistent psychogenic amnesia covering the whole life span. *Cognitive Neuropsychiatry*, v. 2, n. 2, p. 135-158, 1997.

MICHAELIAN, Kourken. *Mental time travel: episodic memory and our knowledge of the personal past*. Cambridge: MIT Press, 2016.

PARFIT, Derek. *Reasons and Persons*. Oxford: Clarendon Press, 1984.

REINHOLD, Nadine; MARKOWITSCH, Hans J. Retrograde episodic memory and emotion: A perspective from patients with dissociative amnesia. *Neuropsychologia*, v. 47, p. 2197-2206, 2009.

SANT'ANNA, André. Mental time travel and the philosophy of memory. *Unisinos Journal of Philosophy*, v. 19, n. 1, p. 52–62, 2018.

SCHACTER, Daniel; ADDIS, Donna Rose. The cognitive neuroscience of constructive memory: remembering the past and imagining the future. *Philosophical Transactions of The Royal Society B*, v. 362, p. 773-786, 2007.

STANILOIU, Angelica; MARKOWITSCH, Hans J. The remains of the day in dissociative amnesia. *Brain Sciences*, v. 2, p. 101-129, 2012.

STANILOIU, Angelica; MARKOWITSCH, Hans J. Long lasting personality changes after the onset of dissociative amnesia. *European Psychiatry*, v. 28, n. 1, p. 1, 2013.

STANILOIU, Angelica; MARKOWITSCH, Hans J.; BRAND, Matthias. Psychogenic amnesia – A malady of the constricted self. *Consciousness and Cognition*, v. 19, p. 778-801, 2010.

STANILOIU, Angelica; MARKOWITSCH, Hans J.; KORDON, Andreas. Psychological causes of autobiographical amnesia: A study of 28 cases. *Neuropsychologia*, v. 110, p. 134-147, 2018.

SUDDENDORF, Thomas; ADDIS, Donna Rose; CORBALLIS, Michael. Mental time travel and the shaping of the human mind. *Philosophical Transactions of The Royal Society B*, v. 364, p. 1317-1324, 2009.

TULVING, Endel. Episodic memory: From mind to brain. *Annu. Rev. Psychol.*, v. 53, p. 1-25, 2002.