



My life story: self-defining memories in Korsakoff syndrome

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ABSTRACT

Background: Self-defining memories are emotionally intense memories that help people define who they are. While such memories play a central role in self-concept and emotional well-being, little is known about how they are affected in Korsakoff's syndrome (KS).

Methods: We invited patients with KS and healthy control participants to retrieve self-defining memories, which were then analysed for specificity (specific vs. general events), emotional valence (positive vs. negative) and integration of meaning (whether the memory was connected to a broader understanding of the self or life experience).

Results: The analysis demonstrated no significant differences between patients with KS and controls in terms of specificity. However, compared with control participants, patients with KS produced more negative and non-integrated self-defining memories. Within-groups comparisons demonstrated more specific than general self-defining memories in patients with KS and control participants. These memories were mainly negative in patients with KS and positive in control participants, non-integrated in patients with KS but integrated in control participants.

Conclusions: These findings demonstrate no difficulties in patients with KS to retrieve specific self-defining memories; however, these memories seem to be mainly related to negative events and enduring concerns or unresolved conflicts.

ARTICLE HISTORY

Received 2 February 2025

Accepted 9 May 2025

KEYWORDS

Autobiographical memory; Korsakoff's syndrome; self; self-defining memories

Introduction

Self-defining memories refer to events that are highly relevant to identity processes (Blagov & Singer, 2004; Singer et al., 2007). These events are vivid, emotionally intense, often repetitively recalled, and focused on enduring concerns or unresolved conflicts (Singer et al., 2013). However, it is important to note that while self-defining memories often involve significant challenges or turning points in one's life, they can encompass a wide range of emotional experiences, including positive, negative, or

neutral emotions, depending on the individual's personal narrative. In addition, self-defining memories help maintain self-consistency and self-coherence, particularly during times of upheaval or difficult transitions (Conway et al., 2004). In line with these assumptions, empirical research has demonstrated the involvement of self-defining memories in the pursuit of long-term goals (Moffitt & Singer, 1994), the anticipation of significant future events (D'Argembeau et al., 2012), meaning making (Blagov & Singer, 2004; Lardi et al., 2010; Thorne et al., 2004), emotional regulation (Lardi et al., 2012; Sutin & Robins, 2005; Wood & Conway, 2006), personality traits (Sutin & Robins, 2005) and the activation of specific self-representations (Çili & Stopa, 2015). For instance, self-defining memories can motivate long-term goals by recalling past successes, help individuals anticipate future events by providing continuity, and aid in emotional regulation by offering meaning or reappraisal of challenging experiences. Moreover, individuals frequently communicate about themselves and their life stories by sharing self-defining memories with others, a process that facilitates intimacy and the transmission of personal experience (Thorne et al., 2004; Thorne & McLean, 2002). Guided by these findings, Singer et al. (2013) proposed an integrated model of narrative identity, according to which self-defining memories lead to the creation of narrative scripts that serve as the ingredients for "chapters" across the lifespan.

Despite the importance of self-defining memories, little is known about these memories in Korsakoff syndrome (KS). KS is an acute neurological syndrome caused by thiamine deficiency, malnutrition and prolonged heavy ingestion of alcohol (Arts et al., 2017; Kessels & Kopelman, 2012). KS is mainly associated with severe impairment in memory (Arts et al., 2017; Fama et al., 2012; Kopelman, 1989). Another characteristic of memory dysfunction in KS is confabulations, that is, the production of memories that are unintentionally incongruous with respect to the subject's history, background and present situation (Borsutzky et al., 2008; Kessels et al., 2008; Rensen et al., 2017). Besides memory impairment, KS is characterised by executive dysfunction (Brion et al., 2014; Pitel et al., 2008; Van Oort & Kessels, 2009). Another cognitive domain that has been found to be impaired in KS is emotion (Brion et al., 2015), as patients with KS may demonstrate a tendency to overestimate the affective content of neutral stimuli (Labudda et al., 2008), as well as a tendency to underestimate their illness (Walvoort et al., 2016). These impairments are particularly relevant to self-defining memories, as difficulties in memory retrieval, emotional processing and goal-directed behaviour could hinder the ability to form, maintain, and integrate meaningful self-defining memories. For instance, impairments in executive functions and memory specificity could lead to more general or fragmented self-defining memories, while emotional dysregulation might influence the emotional valence and coherence of these memories.

While little is known about self-defining memories in KS, there is a large body of research on autobiographical memory in the syndrome; autobiographical memory refers to memory for personal events and facts (Conway, 2005; Rubin, 2005). Research on autobiographical memory has demonstrated that KS leads to a profound disruption of this memory system (El Haj et al., 2018b). More specifically, this research has demonstrated considerable difficulty of patients with KS to retrieve specific autobiographical memories, that is, to retrieve events that had happened at a particular place and time. The difficulty to retrieve specific memories in patients with KS has been observed by Kopelman (1989) who asked patients with KS to retrieve specific autobiographical

events. However, patients tended to produce general rather than specific memories. The same difficulties were reported by El Haj and Nandrino (2017) who analysed whether memories retrieved by patients with KS referred to (1) a general theme, (2) a repeated or an extended event, (3) an event situated in time and/or space, (4) a specific event lasting less than 24 h and situated in time and space or (5) a specific event situated in time and space enriched with phenomenological details such as feelings, perceptions or emotions. Using this analysis, El Haj and Nandrino (2017) observed low autobiographical specificity in patients with KS.

Besides the difficulty to retrieve specific autobiographical memories, patients with KS tend to demonstrate anterograde amnesia, that is, difficulties to retrieve recent memories (Arts et al., 2017; Fama et al., 2012; Kopelman, 1989). However, little is known about the ability of patients with KS to retrieve memories from the “reminiscence bump”. The “reminiscence bump” refers to a substantial increase in memories of events dating from adolescence and early adulthood. These memories typically cover the most significant events in our life (e.g., first day at work, first meeting with a partner ...) and are considered as the result of many first-time experiences that are used later in life as milestones when we encounter similar event or reconstruct our life story (Pillemer, 2001; Thomsen et al., 2011). The reminiscence bump essentially covers self-defining memories as these memories provide the milestones that contribute to the construction and maintenance of identity.

Considering their role in identity maintenance, the study of self-defining memories in KS may contribute to the understanding of identity construction in KS. At the clinical level, maintaining self-defining memories in patients with KS significantly contributes to the maintenance of their sense of personal identity and continuity in their own life story. This assumption can be supported by models proposing an intimate relationship between self-defining memories and identity (Blagov & Singer, 2004; Singer et al., 2013). In these models, self-defining memories have been distinguished from other autobiographical memories as the former memories are relatively resistant to time and are linked to enduring concerns or unresolved conflicts. Other characteristics of self-defining memories are specificity (i.e., whether these memories describe very specific events), emotional valence (i.e., whether these memories describe positive, negative, neutral, or mixed events, including both negative and positive events), and integration of meaning (i.e., whether these memories are integrated in the life story, reflecting a successful ability to update self-concept and personal goals) (Blagov & Singer, 2004). Because these three characteristics have been typically investigated in research on self-defining memories in healthy normal populations and pathological populations (Berna et al., 2011; Nandrino & Gandolphe, 2017; Sutherland & Bryant, 2005), we evaluated self-defining memories in KS regarding these characteristics.

To summarise, in the current study, we investigated self-defining memories in patients with KS. As previously mentioned, these memories contribute to the creation of narrative scripts that serve as the ingredients for the formation and maintenance of identity (Blagov & Singer, 2004; Singer et al., 2013). In the context of KS, self-defining memories may play a crucial role in memory reconstruction, as individuals with memory impairments often rely on reconstructed memories to make sense of their past and maintain a sense of personal continuity. Therefore, the study of these memories in KS may contribute to the understanding of how patients with KS reconstruct memories to create and

maintain their life story, and consequently, to define who they are. To this aim, we invited patients with KS and healthy control participants to produce self-defining memories. Following the classification of Blagov and Singer (2004), we compared self-defining memories regarding their specificity (specific vs. general), emotional valence (neutral, positive, negative, or mixed), and integration of meaning (integrative vs. non-integrative) between patients with KS and control participants. We expected that, compared with control participants, patients with KS would produce more general, negative and non-integrated self-defining memories.

Method

Participants

We recruited twenty-four patients diagnosed with KS (15 women and nine men; M age = 56.83 years, SD = 5.51; M years of formal education = 9.96, SD = 3.44) from several alcohol-dependence medical units and day-care facilities at Lille and Nantes. As a control group, we recruited 26 participants without previous or current substance addiction and without psychiatric or neurological history (15 women and 11 men; M age = 55.27, years, SD = 4.66; M years of formal education = 9.32, SD = 4.26). The control group was matched with the KS group according to sex ratio [$\chi^2(1, N = 50) = .12, p = .78$], age [$t(48) = 1.08, p = .28$] and educational level [$t(48) = .68, p = .50$]. The diagnosis of KS was made by experienced psychiatrists, using the DSM-IV-TR (2000) criteria for alcohol-induced persisting amnesic disorder. The diagnosis was also based on an extensive history of alcoholism and nutritional depletion, notably thiamine deficiency. All patients with KS were in a chronic (more than one-year post-onset) and stable condition, but had no confusional Wernicke psychosis at the time of testing or signs of alcohol-related dementia (Oslin et al., 1998). Patients were sober at the time of assessment. All patients underwent a cognitive examination, which is described below. This cognitive examination served to confirm amnesic syndrome in the patients as well as normal cognitive performance in the control participants.

Procedures

Cognitive evaluation

As shown in Table 1, in the current study, we evaluated episodic memory, working memory, and verbal fluency. We evaluated episodic memory with the task of Grober and Buschke (1987) in which participants were invited to retain 16 words, each of

Table 1. Cognitive performances of Korsakoff patients and control participants.

Task		Korsakoff $n = 24$	Controls $n = 26$	Between-group comparisons
Episodic memory	Grober and Buschke	6.96 (2.07)	10.47 (1.67)	$t(48) = 6.58, p < .001$
Working memory	Forward Span	5.58 (1.10)	6.31 (1.35)	$t(48) = 2.07, p < .05$
	Backward Span	4.08 (.67)	4.88 (1.03)	$t(48) = 3.56, p < .01$
Verbal fluency	Verbal Fluency	10.21 (3.92)	16.73 (4.41)	$t(48) = 5.48, p < .001$

Note: Standard deviations are shown in parentheses; episodic memory score refers to free recall and maximum score was 16 points; performances in the forward and backward spans refer to the number of correctly repeated digits; performances on verbal fluency refer to number of words beginning with letter *P*.

which describes an item (e.g., chair) that belongs to a different semantic category (e.g., furniture). Afterward, participants were invited, in a distraction condition, to count backwards from 374 in 20s. Counting was followed by two minutes of free recall; participants were invited to recall, as far as possible, the 16 words and the score from this phase provided a measure of episodic memory.

As for working memory, we used the digit span task (Baddeley, 1992) in which participants were invited to repeat a string of single digits in the same order (i.e., forward spans) or in reverse order (i.e., backward spans). As for verbal fluency, participants were allocated one minute to generate as many words as they could beginning with the letter P. Proper nouns and variations on words (e.g., “psychologist” and “psychology”) were not allowed. Score was the number of correctly generated words.

Self-defining memories

We replicated procedures designed by Singer and colleagues (Blagov & Singer, 2004; Singer & Blagov, 2002; Singer & Moffitt, 1992) who proposed a comprehensive classification of self-defining memories. We invited participants to produce one self-defining memory. We explained that self-defining memories refer to their important concerns and that these memories help them to understand who they are. We also explained that these memories would be those they would recount to allow another person to get to know them better. We added that self-defining memories can be those that they think about often and can remember very clearly. We also clarified to the participants that they had to choose memories that went back at least one year and that created strong emotions. Participants were invited to describe verbally the memories and their narratives were recorded. Note that, despite these instructions, four patients failed to provide self-defining memories, and these patients were excluded from the original sample of 28 patients.

After memory retrieval, we analysed memories according to specificity (specific vs. general), emotional valence (neutral, positive, negative, or mixed), and integration of meaning (integrative vs. non-integrative). “Integrative” memories were those that were meaningfully connected to the individual’s broader self-narrative, offering insights into their life course or present self-understanding. Conversely, “non-integrative” memories lacked such connections and often reflected unresolved or unprocessed past events. All memories were transcribed and then analysed by following the coding instructions of Singer and Blagov (2002). Consider the following memory as evoked by a patient with KS

when I was young, I used to spend all my pocket money on alcohol, I used to spend my time in a bar located far from home. One day, a friend of my father saw me at the bar, this friend told my father who was extremely violent when I returned home. I argued with my father until he ordered me to leave the home. I literally hate myself every time I think about this event for not talking again with my father who died without seeing me again ... I am wondering whether he forgives me.

This event was classified as specific as it described a unique event situated in time and space. This event was also classified as negative and non-integrative as it described an unresolved conflict. All memories were rated by two independent judges (clinical psychologists) who were blinded to the group membership of the participants to prevent bias. The judges followed the coding instructions of Singer and Blagov (2002). Inter-

judge agreement was calculated with Cohen's kappa (K) (Brennan & Prediger, 1981) which demonstrated a substantial agreement score (K specificity = 0.83; K emotional valence = 0.82, K integration = 0.79).

Statistical analysis

The number of memories for each characteristic of self-defining memories (specificity, emotional valence, and integration of meaning) is summarised in Table 2. We compared the number of (1) specific and general (2) neutral, positive, negative, and mixed, as well as (3) integrated and non-integrated self-defining memories between patients with KS and control participants. We used chi-square tests because data was categorical.

Results

Specific self-defining memories in patients with KS

Considering specificity, no significant differences were observed between patients with KS and control participants regarding the production of specific [$\chi^2(1, N = 38) = .42, p = .41$] and general memories [$\chi^2(1, N = 12) = .33, p = .48$]. Considering within-groups comparisons, more specific than general memories were observed in patients with KS [$\chi^2(1, N = 24) = 4.17, p < .05$] and control participants [$\chi^2(1, N = 26) = 9.85, p < .01$].

Negative self-defining memories in patients with KS

Considering emotion, and compared with control participants, patients with KS produced less positive memories [$\chi^2(1, N = 17) = 4.76, p < .05$] and more negative memories [$\chi^2(1, N = 16) = 4.00, p < .05$]. However, there were no significant differences between patients with KS and control participants regarding the production of neutral memories [$\chi^2(1, N = 8) = 0.00, p > .10$] and mixed memories [$\chi^2(1, N = 9) = .11, p = .51$]. Considering within-groups comparisons, patients with KS produced more negative than neutral [$\chi^2(1, N = 16) = 7.11, p < .05$], positive [$\chi^2(1, N = 16) = 7.11, p < .05$] and mixed memories [$\chi^2(1, N = 16) = 7.11, p < .05$], all remaining comparisons were non-significant (e.g., neutral vs. positive, neutral vs. mixed ...). Control participants produced more positive than neutral [$\chi^2(1, N = 17) = 8.01, p < .05$], negative [$\chi^2(1, N = 17) = 8.01, p < .05$] and mixed memories [$\chi^2(1, N = 18) = 7.56, p < .05$], all remaining comparisons were non-significant (e.g., neutral vs. positive, neutral vs. mixed ...).

Table 2. The distribution of self-defining memories according to their specificity, emotional valence, and integration of meaning.

		Korsakoff $n = 24$	Controls $n = 26$
Specificity	Specific	17	21
	General	7	5
Emotion	Neutral	4	4
	Positive	4	13
	Negative	12	4
	Mixed	4	5
Integration	Integrated	7	20
	Non-integrated	17	6

Note: Patients with Korsakoff syndrome and healthy control participants produced, respectively, 24 and 26 self-defining memories (one memory by participant). The sum of memories in each category (specificity, emotion, and integration) was, therefore, 24 for patients with Korsakoff syndrome and 26 for control participants.

Non-integrated general self-defining memories in patients with KS

Considering integration, and compared with control participants, patients with KS produced less integrated memories [$\chi^2(1, N = 27) = 6.26, p < .05$] and more non-integrated memories [$\chi^2(1, N = 23) = 5.26, p < .05$]. Considering within-groups comparisons, less integrated than non-integrated memories was observed in patients with KS [$\chi^2(1, N = 24) = 4.17, p < .05$] and the reverse was observed in control participants [$\chi^2(1, N = 26) = 7.54, p < .01$].

Discussion

In the current study, we investigated the characteristics of self-defining memories (i.e., specificity, emotional valence, and integration of meaning) in KS. Results demonstrated no significant differences between patients with KS and control participants in terms of specificity. However, compared with control participants, patients with KS produced more negative and non-integrated self-defining memories. Within-groups comparisons demonstrated more specific than general self-defining memories in patients with KS and control participants. These memories were mainly negative in patients with KS and positive in control participants, non-integrated in patients with KS but integrated in control participants.

Characteristics of self-defining memories in patients with KS

To begin with specificity, and contrary to our hypothesis, self-defining memories in patients with KS were mainly specific. These findings are at odds with a body of research demonstrating difficulties in patients with KS to produce specific autobiographical memories (El Haj et al., 2018a, 2018b; El Haj & Nandrino, 2017; Kopelman, 1989; Kopelman et al., 1999). The difficulty of patients with KS to produce specific memories was also observed for self-unrelated memories. Research has demonstrated difficulties in patients with KS to remember the specific context in which a self-unrelated event was previously encountered, such as remembering a location of drawings (Kovner et al., 1988), the position of a spot of light presented on a board (Holdstock et al., 1999), a location of pictures on cards (Kopelman et al., 1997), a location of pictures of objects in grids (Shoqeirat & Mayes, 1991), a location of words presented in the corners of a screen (Mayes et al., 1991), a location in which objects had been placed (El Haj et al., 2017a), to whom information has been told (El Haj et al., 2016), and the duration of events (Brand et al., 2003; Brion et al., 2017; El Haj et al., 2017b; Kinsbourne & Hicks, 1990; Mimura et al., 2000). These studies mirror the general compromise of episodic memory in KS (Fama et al., 2004; Fama et al., 2012; Pitel et al., 2008), as well as the contextual account according to which episodic memory decline in KS is caused by an inability to encode, store or retrieve contextual information (Kessels & Kopelman, 2012). Although memory performance in patients with KS is mainly characterised by difficulties to remember specific events, these difficulties seem to be alleviated with patients retrieving self-defining memories. Owing to their relevance to the self and identity, these memories seem to be relatively preserved in patients with KS. These memories may be also relatively preserved owing to their vividness and emotional intensity (Blagov & Singer, 2004; Singer et al., 2007).

Regarding emotion, self-defining memories in patients with KS were mainly negative. These findings demonstrate that access to positive self-defining memories or, alternatively, the encoding of these memories, is impaired and that the possibility of experiencing a positive emotion is limited in the syndrome. In contrast, negative emotions seem to be predominant when patients retrieve memories intimately related to their life-story. As illustrated in the example about coding of memories (see the method section), memories retrieved by patients with KS described negative events such as conflicts, death of family members and friends, as well as events related with disease and alcohol consumption. The patients' life-story may cover negative events, a bias that may reflect a dysfunction in self-images and beliefs. In the context of the syndrome and vulnerability, the reconstruction of self-defining memories seems to be negatively-oriented in the sense that self-images and life-story are likely to be tainted negatively in KS. By "reconstruction," we refer to the process through which individuals reappraise or reinterpret past experiences in light of their current cognitive and emotional state. In patients with KS, this process of reconstructing memories might be influenced by their current negative self-image, cognitive limitations, and the challenges they face in accessing and integrating autobiographical content. This assumption is supported by previous research demonstrating that self-defining memories are mainly negative and containing references to alcohol in non-amnesic individuals with Alcohol Use Disorders, even those detoxified (Cuervo-Lombard et al., 2016; Nandrino & Gandolphe, 2017). However, more recent studies (De Groote et al., 2023; Pabst et al., 2024) suggest that the predominance of negative memories may not solely reflect difficulties with encoding or access to positive memories but may also be linked to enhanced retrieval of negative memories in populations with alcohol use disorders. These studies emphasise that the emotional valence of autobiographical memories in such populations may be influenced by both encoding impairments and biases toward recalling negative experiences. We suggest that similar processes may be at play in KS, where the retrieval of negative memories could be facilitated by their emotional intensity, irrespective of encoding difficulties. Our assumption is further supported by a study demonstrating a disturbance in processing of negative emotions (i.e., decoding voices depicting anger and fear) in patients with KS (Brion et al., 2018).

The finding that patients with KS produced predominantly negative and non-integrated self-defining memories aligns with prior evidence suggesting that KS may be accompanied by a profile reminiscent of depressive symptomatology. Specifically, Oudman et al. (2018) reported that patients with KS were able to self-report experiences of social and emotional loneliness, a negative self-evaluation that is commonly observed in depression. This raises the possibility that while KS is not formally characterised as a depressive disorder, it may share significant affective and motivational features with it, including negative self-focus, lack of initiative, social withdrawal, and persistent feelings of loneliness. An additional consideration is that patients with KS may also exhibit reduced insight into their own cognitive and memory impairments, which could contribute to the production of fragmented or poorly integrated self-representations. Rather than lacking ideas about themselves per se, they may lack awareness of their memory limitations, affecting how they retrieve and evaluate autobiographical material. This profile may not only influence the content of autobiographical recall, as seen in the present study, but also contribute to broader psychosocial challenges in the patients'

daily life. Further research should investigate the extent to which depressive-like symptoms overlap with the cognitive and emotional alterations in KS, and whether interventions targeting emotional well-being might help buffer some of these negative self-representations. Besides being specific and negative, self-defining memories in patients with KS were mainly non-integrated. In other words, patients mainly produced memories related to enduring concerns or unresolved conflicts (see, for instance, the memory depicted in the method section). Patients with KS seem to experience difficulties to stand back from significant personal events to integrate them in their life-story. Patients with KS seem to also experience difficulties with evaluating how these events may help them modify the way they see themselves, others, or even the world. The difficulty of patients with KS to integrate self-defining memories may also mirror difficulties to extract meaning or any particular lesson from these salient events. These difficulties are associated with a general difficulty to resolve conflicts related to identity and life-story. According to Conway (2005), autobiographical memory is intimately tied to the identity and the self, and more specifically, the retrieval of autobiographical memories mirrors current goals and objectives. Therefore, the tendency of patients with KS to produce non-integrated self-defining memories may mirror general difficulties to process unresolved conflicts. At the clinical level, this issue is important because integration of memories, especially those negative, and meaning-making processes are important for recovery. Therapeutic interventions typically require an active work on unresolved experiences to offset the tendency to deny or even repress conflicts from the past.

While our findings demonstrate that patients with KS are capable of retrieving self-defining memories with a level of specificity comparable to that of controls, the richness of these memories may differ in important ways. As suggested by Herrmann et al. (2023), while emotionally salient macro-events (e.g., the COVID-19 lockdown) can be vividly relived by individuals with KS, the number of internal (episodic) details recalled is typically lower than in healthy controls. This distinction implies that memory strength—reflected not only in specificity but also in the richness and vividness of episodic content—may be compromised in KS. Our findings therefore support the view that emotional relevance enhances access to self-defining memories in KS, yet the episodic elaboration of these memories may remain reduced (El Haj, 2021). Future research using detailed coding procedures such as the internal/external detail scoring (Levine et al., 2002) may help to further characterise this phenomenon.

Potential functional consequences of self-defining memory differences in KS

The differences observed in self-defining memories in KS—particularly their emotional valence and integration—could have significant functional consequences. The predominance of negative and non-integrated memories may hinder emotional regulation, leading to persistent negative emotions and emotional dysregulation. These memory patterns can also impair identity formation, as individuals with KS may struggle to construct a coherent self-concept, potentially affecting their self-esteem and social interactions. Additionally, the difficulty in integrating memories and learning from past experiences may limit cognitive flexibility, impacting decision-making and behavioural adaptation in daily life. Therefore, the challenges in self-defining memory retrieval in KS may

extend beyond cognitive functioning, influencing emotional well-being, interpersonal relationships, and personal growth.

Characteristics of self-defining memories in control participants

Like patients with KS, self-defining memories in control participants were mainly specific. However, and unlike patients with KS, self-defining memories in control participants were mainly positive and integrated. These findings can be attributed to the normal cognitive and clinical functioning in the control participants as healthy individual typically encounter no difficulties to retrieve one specific memory. Further, normal healthy aging is typically characterised by a positive bias, that is, a tendency to retrieve positive and integrated memories (Carstensen et al., 2011; Reed & Carstensen, 2012). However, our findings should be considered with some caution because participants were required to retrieve only one self-defining memory. Control participants may demonstrate other tendencies when required to retrieve several memories (e.g., experiencing difficulties to retrieve several specific memories). The same caution should be applied to the interpretation of performances of patients with KS; if asked to retrieve several self-defining memories, these patients may demonstrate a diminished specificity. Note however that we assessed only one self-defining memory to alleviate the cognitive load of our assessment. Further, in an exploratory phase, some patients experienced difficulties to retrieve more than one self-defining memory, and other patients tended to repeat the same memory.

Conclusion

Generally speaking, little is known about the sense of self in KS and, more specifically, how patients produce memories to construct and maintain their identity and life-story. Our study addresses this gap by evaluating how self-defining memories in patients with KS can be specific, but negative and focused on enduring concerns and unresolved conflicts. The study of self-defining memories in KS merits further attention as it allows for understanding how patients rely on memory to describe what they know about their self and their past and what they tend to promote and believe about their self-images and identity. The study of self-defining memories in KS is also important because it highlights how memories can be reconstructed to support the current self-related goals as well as the motivation to process unresolved conflicts to allow meaning-making through integrating negative events into a coherent and uplifting life story.

Authors contribution

Conceptualisation & assessment: MEH & FQ; Analysis: MEH, AA, & FQ; Writing: MEH, AA, & FQ.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

Ethical standards

This study complies with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Data availability statement

Data available on request from the authors. Due to the privacy-sensitive qualities of the memories, it is impossible for us to share the data through a public repository. However, it is possible to receive a copy of the data upon request from the authors on the condition of signing a non-disclosure agreement.

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References

- American Psychiatric Association. (2000). *Task force on DSM-IV. Diagnostic and statistical manual of mental disorders: DSM-IV-TR*.
- Arts, N. J. M., Walvoort, S. J. W., & Kessels, R. P. C. (2017). Korsakoff's syndrome: A critical review. *Neuropsychiatric Disease and Treatment*, 13, 2875–2890. <https://doi.org/10.2147/NDT.S130078>
- Baddeley, A. (1992). Working memory. *Science*, 255(5044), 556–559. <https://doi.org/10.1126/science.1736359>. <http://www.ncbi.nlm.nih.gov/pubmed/1736359>
- Berna, F., Bennouna-Greene, M., Potheegadoo, J., Verry, P., Conway, M. A., & Danion, J.-M. (2011). Self-defining memories related to illness and their integration into the self in patients with schizophrenia. *Psychiatry Research*, 189(1), 49–54. <https://doi.org/10.1016/j.psychres.2011.03.006>
- Blagov, P. S., & Singer, J. A. (2004). Four dimensions of self-defining memories (specificity, meaning, content, and affect) and their relationships to self-restraint, distress, and repressive defensiveness. *Journal of Personality*, 72(3), 481–511. <https://doi.org/10.1111/j.0022-3506.2004.00270.x>
- Borsutzky, S., Fujiwara, E., Brand, M., & Markowitsch, H. J. (2008). Confabulations in alcoholic Korsakoff patients. *Neuropsychologia*, 46(13), 3133–3143. <https://doi.org/10.1016/j.neuropsychologia.2008.07.005>
- Brand, M., Kalbe, E., Fujiwara, E., Huber, M., & Markowitsch, H. J. (2003). Cognitive estimation in patients with probable Alzheimer's disease and alcoholic Korsakoff patients. *Neuropsychologia*, 41(5), 575–584. [https://doi.org/10.1016/S0028-3932\(02\)00183-5](https://doi.org/10.1016/S0028-3932(02)00183-5). <http://www.ncbi.nlm.nih.gov/pubmed/12559150>
- Brennan, R. L., & Prediger, D. J. (1981). Coefficient kappa: Some uses, misuses, and alternatives. *Educational and Psychological Measurement*, 41(3), 687–699. <https://doi.org/10.1177/001316448104100307>

- Brion, M., de Timary, P., de Wilmars, S. M., & Maurage, P. (2018). Impaired affective prosody decoding in severe alcohol use disorder and Korsakoff syndrome. *Psychiatry Research*, 264, 404–406. <https://doi.org/10.1016/j.psychres.2018.04.001>
- Brion, M., de Timary, P., Pitel, A. L., & Maurage, P. (2017). Source memory in Korsakoff syndrome: Disentangling the mechanisms of temporal confusion. *Alcoholism: Clinical and Experimental Research*, 41(3), 596–607. <https://doi.org/10.1111/acer.13318>
- Brion, M., D'Hondt, F., Davidoff, D. A., & Maurage, P. (2015). Beyond cognition: Understanding affective impairments in Korsakoff syndrome. *Emotion Review*, 8(4), 376–384. <https://doi.org/10.1177/1754073915594433>
- Brion, M., Pitel, A. L., Beaunieux, H., & Maurage, P. (2014). Revisiting the continuum hypothesis: Toward an in-depth exploration of executive functions in Korsakoff syndrome. *Frontiers in Human Neuroscience*, 8, 498. <https://doi.org/10.3389/fnhum.2014.00498>
- Carstensen, L. L., Turan, B., Scheibe, S., Ram, N., Ersner-Hershfield, H., Samanez-Larkin, G. R., Brooks, K. P., & Nesselroade, J. R. (2011). Emotional experience improves with age: Evidence based on over 10 years of experience sampling. *Psychology and Aging*, 26(1), 21–33. <https://doi.org/10.1037/a0021285>
- Çili, S., & Stopa, L. (2015). The retrieval of self-defining memories is associated with the activation of specific working selves. *Memory (Hove, England)*, 23(2), 233–253. <https://doi.org/10.1080/09658211.2014.882955>
- Conway, M. A. (2005). Memory and the self. *Journal of Memory and Language*, 53(4), 594–628. <https://doi.org/10.1016/j.jml.2005.08.005>
- Conway, M. A., Singer, J. A., & Tagini, A. (2004). The self and autobiographical memory: Correspondence and coherence. *Social Cognition*, 22(5), 491–529. <https://doi.org/10.1521/soco.22.5.491.50768>
- Cuervo-Lombard, C., Raucher-Chene, D., Barriere, S., Van der Linden, M., & Kaladjian, A. (2016). Self-defining memories in recently detoxified alcohol-dependent patients. *Psychiatry Research*, 246, 533–538. <https://doi.org/10.1016/j.psychres.2016.09.040>
- D'Argembeau, A., Lardi, C., & Van der Linden, M. (2012). Self-defining future projections: Exploring the identity function of thinking about the future. *Memory (Hove, England)*, 20(2), 110–120. <https://doi.org/10.1080/09658211.2011.647697>
- De Groote, C., Olivier, C., Philippe, T., Claire, T., & Nandrino, J.-L. (2023). Autobiographical memories cued by self-statements in patients with alcohol use disorder: Linking self-conceptions to past events. *Memory (Hove, England)*, 31(5), 732–746. <https://doi.org/10.1080/09658211.2023.2191899>
- El Haj, M. (2021). Autobiographical memory in Korsakoff syndrome: A review. *L'Encéphale*, 47(4), 356–361. <https://doi.org/10.1016/j.encep.2020.11.013>
- El Haj, M., Daoudi, M., Gallouj, K., Moustafa, A. A., & Nandrino, J.-L. (2018a). When your face describes your memories: Facial expressions during retrieval of autobiographical memories. *In Reviews in the Neurosciences*, 29(8), 861–872.
- El Haj, M., Gandolphe, M. C., Moustafa, A. A., & Nandrino, J. L. (2018b). Tell about yourself to improve your autobiographical memory: A study of Korsakoff's syndrome. *Psychiatry Research*, 268, 37–41. <https://doi.org/10.1016/j.psychres.2018.06.064>
- El Haj, M., Kessels, R. P., Matton, C., Bacquet, J. E., Urso, L., Cool, G., Guidez, F., Potier, S., Nandrino, J. L., & Antoine, P. (2016). Destination memory in Korsakoff's syndrome. *Alcoholism: Clinical and Experimental Research*, 40(6), 1321–1327. <https://doi.org/10.1111/acer.13070>
- El Haj, M., & Nandrino, J. L. (2017). Phenomenological characteristics of autobiographical memory in Korsakoff's syndrome. *Consciousness and Cognition*, 55(Supplement C), 188–196. <https://doi.org/10.1016/j.concog.2017.08.011>
- El Haj, M., Nandrino, J. L., Coello, Y., Miller, R., & Antoine, P. (2017a). Source monitoring in Korsakoff's syndrome: “Did I touch the toothbrush or did I imagine doing so?”. *Cortex*, 91, 262–270. <https://doi.org/10.1016/j.cortex.2017.02.006>

- El Haj, M., Nandrino, J. L., Kessels, R. P. C., Matton, C., Bacquet, J. E., Urso, L., & Antoine, P. (2017b). Retrospective time perception in Korsakoff's syndrome. *Journal of Neuropsychiatry and Clinical Neurosciences*, 29(4), 319–325. <https://doi.org/10.1176/appi.neuropsych.16100206>
- Fama, R., Marsh, L., & Sullivan, E. V. (2004). Dissociation of remote and anterograde memory impairment and neural correlates in alcoholic Korsakoff syndrome. *Journal of the International Neuropsychological Society*, 10(3), 427–441. <https://doi.org/10.1017/S135561770410310X>
- Fama, R., Pitel, A. L., & Sullivan, E. V. (2012). Anterograde episodic memory in Korsakoff syndrome. *Neuropsychology Review*, 22(2), 93–104. <https://doi.org/10.1007/s11065-012-9207-0>
- Grober, E., & Buschke, H. (1987). Genuine memory deficits in dementia. *Developmental Neuropsychology*, 3(1), 13–36. <https://doi.org/10.1080/87565648709540361>
- Herrmann, D., Oudman, E., & Postma, A. (2023). The era of our lives: The memory of Korsakoff patients for the first Covid-19 pandemic lockdown in the Netherlands. *Consciousness and Cognition*, 107, 103454. <https://doi.org/10.1016/j.concog.2022.103454>
- Holdstock, J. S., Mayes, A. R., Cezayirli, E., Aggleton, J. P., & Roberts, N. (1999). A comparison of egocentric and allocentric spatial memory in medial temporal lobe and Korsakoff amnesics. *Cortex*, 35(4), 479–501. [https://doi.org/10.1016/S0010-9452\(08\)70814-1](https://doi.org/10.1016/S0010-9452(08)70814-1). <http://www.ncbi.nlm.nih.gov/pubmed/10574076>
- Kessels, R. P., & Kopelman, M. D. (2012). Context memory in Korsakoff's syndrome. *Neuropsychology Review*, 22(2), 117–131. <https://doi.org/10.1007/s11065-012-9202-5>
- Kessels, R. P., Kortrijk, H. E., Wester, A. J., & Nys, G. M. (2008). Confabulation behavior and false memories in Korsakoff's syndrome: Role of source memory and executive functioning. *Psychiatry and Clinical Neurosciences*, 62(2), 220–225. <https://doi.org/10.1111/j.1440-1819.2008.01758.x>
- Kinsbourne, M., & Hicks, R. E. (1990). The extended present: Evidence from time estimation by amnesics and normals. In G. Vallar & T. Shallice (Eds.), *Neuropsychological impairments of short-term memory* (pp. 319–329). Cambridge University Press.
- Kopelman, M. D. (1989). Remote and autobiographical memory, temporal context memory and frontal atrophy in Korsakoff and Alzheimer patients. *Neuropsychologia*, 27(4), 437–460. [https://doi.org/10.1016/S0010-9452\(08\)70814-110.1016/0028-3932\(89\)90050-X](https://doi.org/10.1016/S0010-9452(08)70814-110.1016/0028-3932(89)90050-X). <http://www.ncbi.nlm.nih.gov/pubmed/2733818>
- Kopelman, M. D., Stanhope, N., & Kingsley, D. (1997). Temporal and spatial context memory in patients with focal frontal, temporal lobe, and diencephalic lesions. *Neuropsychologia*, 35(12), 1533–1545. [https://doi.org/10.1016/S0028-3932\(97\)00076-6](https://doi.org/10.1016/S0028-3932(97)00076-6). <http://www.ncbi.nlm.nih.gov/pubmed/9460723>
- Kopelman, M. D., Stanhope, N., & Kingsley, D. (1999). Retrograde amnesia in patients with diencephalic, temporal lobe or frontal lesions. *Neuropsychologia*, 37(8), 939–958. [https://doi.org/10.1016/S0028-3932\(98\)00143-2](https://doi.org/10.1016/S0028-3932(98)00143-2). <http://www.ncbi.nlm.nih.gov/pubmed/10426519>
- Kovner, R., Dopkins, S., & Goldmeier, E. (1988). Effects of instructional set on amnesic recognition memory performance. *Cortex*, 24(3), 477–483. [https://doi.org/10.1016/S0010-9452\(88\)80012-1](https://doi.org/10.1016/S0010-9452(88)80012-1). <http://www.ncbi.nlm.nih.gov/pubmed/3191732>
- Labudda, K., Todorovski, S., Markowitsch, H. J., & Brand, M. (2008). Judgment and memory performance for emotional stimuli in patients with alcoholic Korsakoff syndrome. *Journal of Clinical and Experimental Neuropsychology*, 30(2), 224–235. <https://doi.org/10.1080/13803390701363811>
- Lardi, C., D'Argembeau, A., Chanal, J., Ghisletta, P., & Van der Linden, M. (2010). Further characterisation of self-defining memories in young adults: A study of a Swiss sample. *Memory (Hove, England)*, 18(3), 293–309. <https://doi.org/10.1080/09658211003601522>
- Lardi, C., Ghisletta, P., & Van der Linden, M. (2012). What is the nature of the self-defining memories of repression-prone individuals? *Self and Identity*, 11(4), 492–515. <https://doi.org/10.1080/15298868.2011.603902>
- Levine, B., Svoboda, E., Hay, J. F., Winocur, G., & Moscovitch, M. (2002). Aging and autobiographical memory: Dissociating episodic from semantic retrieval. *Psychology and Aging*, 17(4),

- 677–689. <https://doi.org/10.1037/0882-7974.17.4.677>. <http://www.ncbi.nlm.nih.gov/pubmed/12507363>
- Mayes, A. R., Meudell, P. R., & MacDonald, C. (1991). Disproportionate intentional spatial-memory impairments in amnesia. *Neuropsychologia*, 29(8), 771–784. [https://doi.org/10.1016/0028-3932\(91\)90071-F](https://doi.org/10.1016/0028-3932(91)90071-F). <http://www.ncbi.nlm.nih.gov/pubmed/1944877>
- Mimura, M., Kinsbourne, M., & O'Connor, M. (2000). Time estimation by patients with frontal lesions and by Korsakoff amnesics. *Journal of the International Neuropsychological Society*, 6(05), 517–528. <https://doi.org/10.1017/s1355617700655017>
- Moffitt, K. H., & Singer, J. A. (1994). Continuity in the life story: Self-defining memories, affect, and approach/avoidance personal strivings. *Journal of Personality*, 62(1), 21–43. <https://doi.org/10.1111/j.1467-6494.1994.tb00793.x>
- Nandrino, J. L., & Gandolphe, M. C. (2017). Characterization of self-defining memories in individuals with severe alcohol use disorders after mid-term abstinence: The impact of the emotional valence of memories. *Alcoholism: Clinical and Experimental Research*, 41(8), 1484–1491. <https://doi.org/10.1111/acer.13424>
- Oslin, D., Atkinson, R. M., Smith, D. M., & Hendrie, H. (1998). Alcohol related dementia: Proposed clinical criteria. *International Journal of Geriatric Psychiatry*, 13(4), 203–212. [https://doi.org/10.1002/\(SICI\)1099-1166\(199804\)13:4<203::AID-GPS734>3.0.CO;2-B](https://doi.org/10.1002/(SICI)1099-1166(199804)13:4<203::AID-GPS734>3.0.CO;2-B). <http://www.ncbi.nlm.nih.gov/pubmed/9646147>
- Oudman, E., van Dam, M., & Postma, A. (2018). Social and emotional loneliness in Korsakoff's syndrome. *Cognitive Neuropsychiatry*, 23(5), 307–320. <https://doi.org/10.1080/13546805.2018.1505607>
- Pabst, A., d'Argembeau, A., de Longueville, X., de Timary, P., & Maurage, P. (2024). Social episodic memory in severe alcohol use disorder: Positive encoding bias and negative bias in accessibility of interpersonal information. *Alcohol, Clinical and Experimental Research*, 48(7), 1336–1346. <https://doi.org/10.1111/acer.15344>
- Pillemer, D. B. (2001). Momentous events and the life story. *Review of General Psychology*, 5(2), 123–134. <https://doi.org/10.1037/1089-2680.5.2.123>
- Pitel, A. L., Beaunieux, H., Witkowski, T., Vabret, F., de la Sayette, V., Viader, F., Desgranges, B., & Eustache, F. (2008). Episodic and working memory deficits in alcoholic Korsakoff patients: The continuity theory revisited. *Alcoholism: Clinical and Experimental Research*, 32(7), 1229–1241. <https://doi.org/10.1111/j.1530-0277.2008.00677.x>
- Reed, A. E., & Carstensen, L. L. (2012). The theory behind the age-related positivity effect. *Frontiers in Psychology*, 3, 339. <https://doi.org/10.3389/fpsyg.2012.00339>
- Rensen, Y. C., Oosterman, J. M., Walvoort, S. J., Eling, P. A., & Kessels, R. P. (2017). Intrusions and provoked and spontaneous confabulations on memory tests in Korsakoff's syndrome. *Journal of Clinical and Experimental Neuropsychology*, 39(2), 101–111. <https://doi.org/10.1080/13803395.2016.1204991>
- Rubin, D. C. (2005). A basic-systems approach to autobiographical memory. *Current Directions in Psychological Science*, 14(2), 79–83. <https://doi.org/10.1111/j.0963-7214.2005.00339.x>
- Shoqeirat, M. A., & Mayes, A. R. (1991). Disproportionate incidental spatial-memory and recall deficits in amnesia. *Neuropsychologia*, 29(8), 749–769. [https://doi.org/10.1016/0028-3932\(91\)90070-O](https://doi.org/10.1016/0028-3932(91)90070-O). <http://www.ncbi.nlm.nih.gov/pubmed/1944876>
- Singer, J. A., & Blagov, P. (2002). *Classification system & scoring manual for self-defining memories*. Connecticut College.
- Singer, J. A., Blagov, P., Berry, M., & Oost, K. M. (2013). Self-defining memories, scripts, and the life story: Narrative identity in personality and psychotherapy. *Journal of Personality*, 81(6), 569–582. <https://doi.org/10.1111/jopy.12005>
- Singer, J. A., & Moffitt, K. H. (1992). An experimental investigation of specificity and generality in memory narratives. *Imagination, Cognition and Personality*, 11(3), 233–257. <https://doi.org/10.2190/72A3-8UPY-GDB9-GX9K>
- Singer, J. A., Rexhaj, B., & Baddeley, J. (2007). Older, wiser, and happier? Comparing older adults' and college students' self-defining memories. *Memory (Hove, England)*, 15(8), 886–898. <https://doi.org/10.1080/09658210701754351>

- Sutherland, K., & Bryant, R. A. (2005). Self-defining memories in post-traumatic stress disorder. *British Journal of Clinical Psychology*, 44(Pt 4), 591–598. <https://doi.org/10.1348/014466505X64081>
- Sutin, A. R., & Robins, R. W. (2005). Continuity and correlates of emotions and motives in self-defining memories. *Journal of Personality*, 73(3), 793–824. <https://doi.org/10.1111/j.1467-6494.2005.00329.x>
- Thomsen, D. K., Pillemer, D. B., & Ivcevic, Z. (2011). Life story chapters, specific memories and the reminiscence bump. *Memory (Hove, England)*, 19(3), 267–279. <https://doi.org/10.1080/09658211.2011.558513>
- Thorne, A., & McLean, K. (2002). Gendered reminiscence practices and self-definition in late adolescence. *Sex Roles*, 46(9-10), 267–277. <https://doi.org/10.1023/A:1020261211979>
- Thorne, A., McLean, K. C., & Lawrence, A. M. (2004). When remembering is not enough: Reflecting on self-defining memories in late adolescence. *Journal of Personality*, 72(3), 513–542. <https://doi.org/10.1111/j.0022-3506.2004.00271.x>
- Van Oort, R., & Kessels, R. P. (2009). Executive dysfunction in Korsakoff's syndrome: Time to revise the DSM criteria for alcohol-induced persisting amnestic disorder? *International Journal of Psychiatry in Clinical Practice*, 13(1), 78–81. <https://doi.org/10.1080/13651500802308290>
- Walvoort, S. J. W., van der Heijden, P. T., Wester, A. J., Kessels, R. P. C., & Egger, J. I. M. (2016). Self-awareness of cognitive dysfunction: Self-reported complaints and cognitive performance in patients with alcohol-induced mild or major neurocognitive disorder. *Psychiatry Research*, 245, 291–296. <https://doi.org/10.1016/j.psychres.2016.08.007>
- Wood, W. J., & Conway, M. A. (2006). Subjective impact, meaning making, and current and recalled emotions for self-defining memories. *Journal of Personality*, 74(3), 811–845. <https://doi.org/10.1111/j.1467-6494.2006.00393.x>

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