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Association between attachment insecurity and couple adjustment: Moderation by couple memory networks

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Abstract

This study investigated whether couple-related memories and their organization in memory networks could act as cognitive resources to protect against the negative impact of insecure attachment on couple adjustment. In two studies ($n1 = 153$, $n2 = 567$), participants in a romantic relationship described a significant couple-related memory and provided networked memories associated with their couple-related memory, to assess its organization in the memory system, and rated each memory for its level of need satisfaction. Findings across the two studies revealed significant moderations of need satisfaction in couple-related memory networks, such that a higher level of satisfaction need within couple-related memory networks was associated with a reduced negative association of attachment anxiety and avoidance with couple adjustment. When examined separately, it was shown that need-satisfying networked memories, but not main couple-related memories, moderated the negative association of insecure attachment with couple adjustment.

KEYWORDS

attachment, couple adjustment, memory, memory network, need satisfaction

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1 | INTRODUCTION

Researchers recognize that close relationships in adulthood are influenced by relationships in infancy (Mikulincer & Shaver, 2007). These first formative relationships will affect our beliefs and expectations regarding ourselves and others and, depending on their quality, they will either facilitate or impede the quality of our relationships (Simpson, 1990). Research on attachment and interpersonal relationships have typically shown that secure attachment is linked to adaptive relational outcomes and avoidant and anxious insecure attachment dimensions are associated with adverse relational outcomes (Mikulincer & Shaver, 2005; Mikulincer, Shaver, & Pereg, 2003). Romantic relationships do not depart from this pattern as attachment avoidance and anxiety have been consistently associated with low couple adjustment (Roisman, Collins, Sroufe, & Egeland, 2005). However, there is still little knowledge of the mechanisms that could counteract the negative association of insecure attachment with couple adjustment. We propose that the relational memories people keep of a specific relationship, such as a romantic partner, and their organization in networks, could serve as cognitive resources to protect against the negative effect of insecure attachment schemas on relationship functioning. The purpose of the present study was to examine whether the negative association of insecure attachment with couple adjustment could be mitigated by key characteristics of couple-related memories[1] and the way these memories are organized in the broader memory system.

2 | THE EFFECTS OF ADULT ATTACHMENT INSECURITY ON COUPLE ADJUSTMENT

The literature on adult attachment builds on Bowlby's seminal theory (Bowlby, 1969, 1973, 1980) and describes the effects and outcomes of adult attachment dimensions (Mikulincer & Shaver, 2007). Research has identified anxiety and avoidance as two distinct insecure attachment dimensions by their respective relation to hyperactivation and deactivation of the attachment behavioral system. Attachment anxiety is characterized by hypervigilance, exaggeration, rumination about potential separation threats, and excessive seeking of relational support, whereas attachment avoidance is characterized by the ignorance of potential separation threats and the inhibition of the need for relational support (Bartholomew & Horowitz, 1991; Mikulincer & Florian, 1998; Mikulincer & Orbach, 1995). Both insecure attachment dimensions have been consistently and independently found to be detrimental to social abilities and relationship quality. For instance, studies have found that individuals with an insecure attachment are more anxious and hostile than securely attached individuals (Kobak & Sceery, 1988) and more likely to feel lonely and to be perceived as less socially competent (Hazan & Shaver, 1987). In terms of romantic relationships, a meta-analysis by Li and Chan (2012) showed that both insecure attachment dimensions were negatively associated with romantic relationship satisfaction and felt partner support.

Adult attachment studies suggest that it is the sense of felt-security derived from the support of an attachment figure that leads to beneficial romantic relational outcomes (Collins, 1996; Murray, Holmes, & Griffin, 2000). Mikulincer and Shaver (2003) proposed that the process underlying this effect is that secure individuals will tend to enact comforting mental representations of past relationship partners (romantic or not) who provided comfort and protection. In contrast, insecure individuals who have limited access to comforting representations have difficulties soothing themselves when confronted with a separation threat and tend instead to rely on secondary strategies to alleviate the perceived lack of support from their partner

(Mikulincer & Shaver, 2007). However, little research has examined these mental representations per se and their availability and organization. In this research, we propose that episodic memories might be one source of mental representations from which insecure individuals could draw in times of stress to buffer the negative effect of their insecure attachment schemas on their romantic relationship functioning.

3 | THE PROTECTIVE FUNCTION OF SECURITY-ENHANCING REPRESENTATIONS AND EPISODIC MEMORIES

Shaver, Mikulincer, Lavy, and Cassidy (2009) have found that by priming security-related semantic representations (i.e., security-enhancing words), the defense mechanisms used by attachment-anxious and attachment-avoidant individuals in dealing with hurt feelings were significantly diminished. Indeed, following such priming, attachment-anxious individuals were found to express less intense feelings of rejection and hostile reactions to being hurt. Conversely, attachment-avoidant individuals were less inclined to deny their hurt feelings and responded with less aggression. Overall, priming semantic security-enhancing representation significantly improved mood, compassion, and altruism (Mikulincer & Shaver, 2001; Mikulincer, Shaver, Gillath, & Nitzberg, 2005). Therefore, it appears that the activation of security-enhancing semantic representations could play a role in countering the negative impacts of insecure attachment.

Another type of representation, episodic representations (i.e., episodic memories), could also play this role. Episodic memories are event-specific units of personal experience (Conway, 2009).[2] They are most often quickly forgotten, but if they are relevant to the self, they can be maintained over months, years, or a lifetime as a function of the degree to which they are integrated into the self (Conway, 2005, 2009). Episodic memories can reflect or underlie values, beliefs, and self-images, thus, providing a sense of continuity and stability to the self (Conway, 2005). Singer and Salovey (1993) introduced the construct of self-defining memories to refer to a specific type of episodic memories that are easily and chronically accessible, often recalled or activated, emotionally intense, self-relevant, and central to one's identity. Self-defining memories are thought to help define and maintain long-term goals relevant to the self (e.g., a caring romantic relationship). Furthermore, this structural effect of memory typically occurs in a domain-specific manner (Bouizegarene & Philippe, 2016; Conway, Singer, & Tagini, 2004). That is, self-defining memories often come to represent the domain in which they were experienced and influence the person's thoughts, behaviors, and emotions in that domain. For instance, the memory of an exalting first date can be elected to represent a specific romantic relationship and since that memory is positive, it will positively influence the person's thoughts, behaviors, and emotions with the partner of that romantic relationship. As such, a positive domain-specific self-defining memory could act as a psychological resource in the domain within which the event of the memory occurred.

Research by Philippe, Koestner, Beaulieu-Pelletier, and Lecours (2011); Philippe, Koestner, Beaulieu-Pelletier, Lecours, and Lekes (2012) has established that a core experiential component encoded with memories are remembered levels of three basic psychological needs as defined by self-determination theory (Ryan & Deci, 2017): autonomy (the need for taking on initiatives, and experiencing freedom and volition), relatedness (the need for true connection and closeness), and competence (the need to feel efficacious and capable). The satisfaction of these three basic needs characterizing the event of a memory (see Method section for

illustrative examples) was found to be associated with and to predict changes in well-being indices over time, more than the valence of the memory (i.e., whether the memory is positive or negative) (Philippe et al., 2011, 2012). Indeed, even though valence and need satisfaction have been found to be correlated, sometimes valence and need satisfaction can be opposite. For instance, the memory of a negative event can be characterized by the satisfaction of autonomy and competence (e.g., aptly expressing one's limits in an interpersonal conflict) or by the satisfaction of relatedness (e.g., being comforted after a major failure). In sum, it appears that need satisfaction can be seen as a robust indicator of the degree to which a domain-specific self-defining memory will beneficially impact that domain.

Finally, memories do not exist in isolation. They associate with other memories through contiguity of different elements, such as similar events (Brown & Schopflocher, 1998), emotions (Demblon, Bahri, & D'Argembeau, 2016), and themes (Kemp, Burt, & Malinen, 2009), thereby forming memory networks. Consequently, when a memory is activated by an environmental trigger or is deliberately recalled, it will also activate other associated networked memories. Such a memory network can therefore have a buffering effect for some memories that are part of that network.[3] If a need-thwarting memory is part of an overall need-satisfying network, these need-satisfying networked memories should reduce the negative impact of the main need-thwarting memory. Conversely, a need-satisfying memory part of a network with other need-thwarting networked memories will result in an attenuation of the positive impact of the main need-satisfying memory (e.g., Philippe & Houle, 2020). Thus, in certain cases, the effect of the networked memories can surpass the one of the main memory (e.g., Philippe, Dobbin, Ross, & Houle, 2018; Philippe & Houle, 2020), although both typically contribute independently to outcomes (e.g., Demblon et al., 2016; Philippe et al., 2012).

Overall, need-thwarting memory networks (i.e., both a main and networked memories) will trigger self-defensive processes due to the potential threat to the self they communicate (Hodgins & Knee, 2002; Philippe et al., 2012). In contrast, need-satisfying memory networks will facilitate openness and approach behaviors (Houle, Philippe, Lecours, & Roulez, 2018; Philippe & Bernard-Desrosiers, 2017). Like security-enhancing semantic representations, we posit that because they are frequently activated and chronically accessible, couple-related need-satisfying memory networks could be used to buffer the negative association between insecure attachment and couple adjustment.

4 | THE PRESENT RESEARCH

Few studies have looked at attachment and couple-related episodic memories. Sutin and Gillath (2009) showed that attachment anxiety and avoidance were associated with more negative and less coherent self-defining couple-related memories. Philippe, Koestner, and Lekes (2013) reported correlations showing that both attachment anxiety and avoidance were negatively correlated with need satisfaction in a self-defining couple-related memory. Thus, insecure individuals should report a lower level of need satisfaction in their couple-related memory networks. However, this should not be the case for all insecure individuals. First, attachment schemas and episodic and autobiographical memories are two independent cognitive repertoires that nourishes each other, but that nevertheless remain independent of each other. Thus, many adults who report an insecure attachment can nevertheless have more or less need satisfying couple-related memories. A correlation between these two repertoires does not imply a perfect overlap.

Second, research has shown that insecurely attached individuals are constantly affected by their partners' buffering behavior (Simpson & Overall, 2014). When experiencing stressful or

threatening events, the partners of insecurely attached individuals can sometimes engage in actions that reduce this distress, console, or respond in novel and compassionate ways that counteract the insecurely attached person's expected schema. These partners' actions can be encoded in memories as life events that stand out of expected scripts. Because of the diverging information they provide, they do not immediately change the more abstract and stable attachment schema (Williams, Conway, & Cohen, 2008). However, these memories can remain accessible and become self-defining of the romantic relationship as episodic and autobiographical memories and can be retrieved later on to be used as a buffering cognitive resource. Finally, these sorts of memories can be accumulated over time to form larger memory networks or they can associate with other memories of other relationships exemplifying other need-satisfying moments or actions, which by their association with the main memory adds to the felt-security and need satisfaction provided by the main memory.

Such couple self-defining memories and their associated networked memories are chronically accessible and accessed (Singer & Salovey, 1993). They can be deliberately recalled or activated by external cues (Conway & Pleydell-Pearce, 2000). These cues can be any stimulus like a surface feature common to the self-defining memory (same object, same location, same person, same emotion) or a common theme (making decision, sexuality, cooking), or a combination of a surface feature and a theme (e.g., when my partner is cooking, when my partner criticizes me). Given the frequent activation of these memories in people's lives, they frequently exert their effect, which over time, can cumulate in enduring changes in couple adjustment, such as increases in relationship quality or breakup, depending on the level of need satisfaction of these memories and of their networks (Philippe et al., 2013). As such, these need-satisfying couple-related memories and networked memories might serve as chronically accessible mental resources to buffer the effect of insecure attachment on relationship functioning.

5 | STUDY 1

We expected that a self-defining need-satisfying memory related to one's romantic relationship, along with its related need-satisfying networked memories, should positively impact the attitude and behavior of people within their romantic relationship and as a result be related to a better couple adjustment. However, because of their insecure attachment, anxious and avoidant individuals should have a low level of need satisfaction characterizing their couple-related memory networks and should have lower couple adjustment. Therefore, we hypothesized that both attachment anxiety and avoidance should be negatively associated with need satisfaction in couple-related memory networks and with couple adjustment, whereas need satisfaction in couple-related memory networks should be positively associated with couple adjustment.

In addition, insecure individuals who have access to need-satisfying couple-related memory networks should benefit from this condition and report greater couple adjustment. Therefore, we also hypothesized that the relation between both insecure attachment dimensions and couple adjustment would be moderated by need satisfaction in couple-related memory networks, such that high levels of need satisfaction in couple-related memory networks should lower the negative association between insecure attachment and couple adjustment toward non-significance. Conversely, low levels of need satisfaction in couple-related memory networks should increase the existing negative association between insecure attachment and couple adjustment. It was also investigated whether both the main couple-related memory and the networked memories would moderate this association or if only one of these components would. Since no

past research has investigated how components of memory networks moderate associations between personality-like variables and outcomes, we did not make a priori hypothesis regarding this issue, but analyzed the results accordingly. Finally, we expected that these associations would hold even after controlling for demographic variables that were found to be associated with couple adjustment in past research, that is, age (Lee & Shehan, 1989), gender (Schumm, Webb, & Bollman, 1998), and relationship duration (Lavner & Bradbury, 2010).

6 | METHOD

6.1 | Participants and procedure

A total of 157 undergraduates and graduates (81% females) who were engaged in a romantic relationship for more than 3 months were recruited from a French-Canadian University. Four participants were excluded because they did not provide a couple-related memory or networked memories, leaving 153 participants for the analyses. Participants' mean age of the final sample was 25.65 years ($SD = 6.97$). A priori power analysis revealed that to detect medium effect sizes ($f^2 = .15$) within a multiple regression analysis with eight predictors at an $\alpha = .05$ and a power of .80, a sample of 109 participants was needed. Participants were contacted through their university emails to inform them that we were conducting an online study on attachment, memory, and relationships. Single participants completed a different questionnaire that will not be analyzed in the present study. Partnered participants completed all measures online and described their memories as the last requirement of the questionnaire. As an incentive, participants were entered into a draw for one of three prizes of $125 CAD. Both Studies 1 and 2 were reviewed and approved by the institutional review board for human subject studies and each participant gave their informed consent.

6.2 | Measures

6.2.1 | Attachment

The Experience in Close Relationships Short-form scale (Wei, Russell, Mallinckrodt, & Vogel, 2007) measures the two adult romantic attachment dimensions of attachment avoidance (i.e., discomfort with closeness and dependence on others) and attachment anxiety (i.e., fear of rejection and abandonment) with a total of 12 items (6 items each), such as "I get frustrated if my romantic partners are not available when I need them" for attachment anxiety and "I am nervous when my partner gets too close to me" for attachment avoidance. Items were rated on a 7-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. In this study, Cronbach alphas were .70 and .71 for the avoidance and anxiety dimensions, respectively.

6.2.2 | Couple adjustment

The 7-item version of the Perceived Relationship Quality Components Inventory (Fletcher, Simpson, & Thomas, 2000) was used. This scale assesses seven dimensions of romantic relationship quality (satisfaction, commitment, trust, passion, love, intimacy, and romance) with one item each on a 7-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. Alpha was .80 in this study.

6.2.3 | Self-defining couple-related memories

Participants were asked to describe in detail a personal memory of an event that they experienced within their current romantic relationship with their partner. They were instructed to choose a memory that revealed how they perceive themselves within their current relationship and that often comes to their mind. Instructions were adapted from previous studies on self-defining memories (Philippe et al., 2013; Singer & Salovey, 1993).

6.2.4 | Need satisfaction in the self-defining couple-related memory

Thereafter, participants were asked to rate the level of need satisfaction or need thwarting they experienced during the event of their memory. Ratings were made on a 7-point Likert scale ranging from −3 (*strongly disagree*) to +3 (*strongly agree*), with option-0 indicating that there was an equal level of both need satisfaction and need thwarting in the event or that the event was not characterized by either need thwarting nor need satisfaction. The scale evaluated the three needs (autonomy, competence, and relatedness) postulated by self-determination theory (Ryan & Deci, 2017) with two items each. Sample items included: "I felt free to do things and to think how I wanted" for autonomy, "I felt capable or skillful" for competence, and "I felt connected to one or more people" for relatedness. All three needs were average in a single index, as typically done in self-determination research (Ryan & Deci, 2017) and in memory research using the construct of need satisfaction (Philippe et al., 2011). Alpha for this index was .85 in this study.

6.2.5 | Networked memories

The memory network task (Brown & Schopflocher, 1998; Philippe et al., 2012; Philippe, Lecours, & Beaulieu-Pelletier, 2009) was used to ask participants to describe other memories that were somehow related to their main self-defining couple-related memory. These memories had to come to their minds spontaneously. They were not required to be related to the romantic sphere. Participants were provided with up to three textboxes to describe networked memories, but they were instructed that they did not have to describe as many networked memories. For each memory, they were asked to rate its need satisfaction using the same items as those used with the main memory ($\alpha = .90$). As per past research (Philippe et al., 2009, 2012), need satisfaction in the couple-related episodic memory was combined with need satisfaction in the networked memories to create a single score representing need satisfaction in couple-related memory networks (they will also be examined separately in the analyses).

6.3 | Illustrative narrative excerpts

6.3.1 | Participant A

Main couple-related memory: "One evening, my boyfriend and I started to talk about our exes. I then realized that it had been one year since my ex-boyfriend and I had broken up. Later, after a sexual intercourse, I started to cry in silence, without my boyfriend noticing it at first. 10 minutes later he asked me for a kiss and then realized that I was crying. He then started to worry that he might have done or said something to put me in that state. He then started to

comfort me, took me in his arms and told me to experience my emotions that it was okay. I was really astonished by this emotion and then I started to laugh hysterically. He didn't understand what was going on and why I was now laughing. But it made me feel good. He then asked me that he was only wondering if I wanted to be elsewhere with someone else. After one minute of reflection and a heavy silence, I said no."

Networked memory 1: "One year before this event, my ex-boyfriend and I decided to put an end to our relationship because we did not get along well anymore. I had strong feelings for him, but he was rather felling friendship toward me. I spent the night crying all the tears of my body, curled up on the floor of my room. My cat was next to me on the floor this night, as the cat of my current boyfriend was next to me in the bed one year later. I did not sleep. The torrent of tears continued until the next day afternoon. It was my first heartbreak."

Networked memory 2: "The next day of the first night spent to my new partner's house, I was working with my ex-boyfriend. We were sitting next to each other all day long. These were painful hours. I was feeling particularly on the edge. I could see in his eyes that he was feeling it. I had really turned the page and I was at the very least sad."

Explanation: Participant A's memory network shows how a main couple-related memory can exemplify both need satisfaction and need thwarting and how these are related to past romantic events from the protagonist's life. A lingering concern is shown in the main memory, but it is intensified by the networked memories.

6.3.2 | Participant B

Main couple-related memory: "The first time that we kissed was particularly striking. He had been in love with me for a long time ago and I didn't know it. It was a summer night and we were walking together on a small island. We lied down on the ground to get some rest and then I felt like kissing him. I couldn't help but to tell him, after which, I immediately apologized because we were friends. However, he confessed everything and then we kissed. He took me in his arms with so much strength, harder than anyone had done it before. I then felt very excited with intensity. It was the first time I had the impression to be that important for someone."

Networked memory 1: "I remember having been very sick when I was to my boyfriend's place. I was in the bathroom and then he entered. I didn't want him to see me in this condition, but I was too weak to push him out. He filled up the bathtub, got me undressed and then lifted me to put me in the bathtub. I was very ashamed of myself, but at the same time I was very touched that he was taking care of me like that."

Networked memory 2: "I remember a trip that we have done at the beginning of our relationship. It was very difficult. We found ourselves in South America and we barely spoke Spanish and we didn't want to talk to each other, only to hurt each other. I felt totally helpless and I was in anger with myself to react with so much meanness."

Networked memory 3: "The first Christmas that I spent with his family. I am a single child, with no cousins, my parents are divorced, so it was a refreshing change to be in a family of three children with parents who are still together. They showed me a lot of affection and that was really heartwarming."

Explanation: While Participant B's main couple-related memory is a first-time experience (kiss), it is also about finding someone who makes Participant B feel special and significant, more so than anyone else. The networked memories further add to how resourceful the relationship is by highlighting how the boyfriend is able to be caring and non-judging in a time of

need and how his whole family also is. They also provide a great illustration of how partner buffering events can forge resourceful memory networks. The second networked memory is more need-thwarting and can be interpreted in different ways. It may serve to remind the protagonist of potential threats within this relationship despite the positive, serve as a reminder to the protagonist not to spoil the positive of the relationship (illustrated by the protagonist mentioning she was angered with herself to be so mean), or to illustrate growth with respect to the relationship, if their relationship does not go into such harsh conflict anymore.

In sum, couple-related memories and networked memories may serve as direct cognitive resources to provide a sense of security with respect to one's current romantic relationship through their levels of need satisfaction—a sense of security that may be particularly helpful to insecurely attached individuals.

7 | RESULTS

Table 1 reports the means, standard deviations, and correlations of all variables. Attachment anxiety and attachment avoidance were both negatively correlated with couple adjustment, thereby replicating previous findings (Simpson, 1990) that insecure attachment was negatively associated with couple adjustment. More importantly, and in regard of our hypotheses, both dimensions of attachment were negatively associated with need satisfaction in the couple-related memory network, which was positively correlated with couple adjustments. Examining separately the components of the couple-related memory network, that is, need satisfaction in the main memory and in the networked memories showed that they were both negatively associated with the two dimensions of attachment and positively associated with couple adjustment.

A first multiple regression analysis was conducted to analyze the associations of anxious and avoidant attachment dimensions and need satisfaction in memory networks with couple adjustment. At Step 1, we controlled for the following variables: Age, sex, and duration of the relationship. At Step 2, we introduced the two insecure attachment dimensions and at Step 3 need satisfaction in couple-related memory networks was entered. At Step 4, two interaction terms were entered: each of the two attachment dimensions combined with need satisfaction in couple-related memory networks. Results are shown in Table 2. At Step 1, no control variable was associated with couple adjustment. At Step 2, attachment avoidance and anxiety were both negatively associated with couple adjustment. At Step 3, need satisfaction in the couple-related memory network was found to be positively associated with couple adjustment.

At Step 4, there were also significant interactions between attachment anxiety and need satisfaction in couple-related memory networks and between attachment avoidance and need satisfaction in couple-related memory networks. Simple effect analyses (see Figure 1) revealed that attachment anxiety was unrelated to couple adjustment when people had access to memory networks with high level (+1 *SD*) of need satisfaction, $B = -.03$, $SE = .08$, $\beta = -.03$, $t(144) = -0.31$, $p = .75$. However, attachment anxiety was negatively associated with couple adjustment, $B = -.27$, $SE = .09$, $\beta = -.31$, $t(144) = -3.07$, $p < .01$, when the level of need satisfaction in memory networks was low (−1 *SD*). Similar results were obtained for attachment avoidance, as it was strongly negatively associated with couple adjustment when the level of need satisfaction in memory networks was low (−1 *SD*), $B =. -.50$, $SE = .075$, $\beta = -.57$, $t(144) = -6.70$, $p < .01$, but much less negatively associated with couple adjustment, $B = -.24$, $SE = .09$, $\beta = -.28$, $t(144) = -2.73$, $p < .01$, when the level of need satisfaction was high

TABLE 1 Means, standard deviations, and correlations (Studies 1 and 2)

	Study 1		Study 2									
Variables	***M***	***SD***	***M***	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
(1) Relationship duration (months)	48.96	75.38	46.11	57.72	—	−.02	.28**	—	−.08	−.05	−.10	−.19*
(2) Attachment anxiety	3.07	1.04	3.14	1.04	−.06*	—	.09	—	−.23**	−.16*	−.21**	−.23**
(3) Attachment avoidance	2.21	.83	2.10	.85	.06*	.23**	—	—	−.22**	−.17*	−.21**	−.47**
(4) Couple NS in general	—	—	6.09	.88	−.14	−.37**	−.52**	—	—	—	—	—
(5) Memory networks NS	1.60	1.03	1.28	1.25	.01	−.24**	−.22**	.21**	—	.79**	.92**	.37**
(6) Main memory NS	1.78	1.22	1.51	1.42	−.05	−.19**	−.21**	.23**	.80**	—	.51**	.24**
(7) Networked memories NS	1.52	1.12	1.15	1.42	.05*	−.22**	−.18**	.16**	.94**	.56**	—	.37**
(8) Couple adjustment	5.62	.88	0.00[a]	.96	−.16*	−.31**	−.56**	.77**	.24**	.25**	.20**	—

Note. Correlations of Study 1 appear above the diagonal, whereas those of Study 2 appear below it.
Abbreviation: NS, need satisfaction.
*$p < .05$.
**$p < .01$.
[a]Standardized measure.

TABLE 2 Multiple regression analyses of insecure attachment on couple adjustment moderated by need satisfaction in couple-related memory networks (Studies 1 and 2)

Independent variables	Study 1 (n = 153)				Study 2 (n = 563)			
Step 1	***B***	***SE***	**β**	***t***	***B***	***SE***	**β**	***t***
Age	.01	.01	−11	−1.14	−.01	.01	−.09	−3.02*
Sex	.07	.18	.03	.39	.01	.06	.00	.15
Relationship duration	−.13	.19	−.06	−.66	−.01	.06	.00	−.15
Couple NS in general	—	—	—	—	.82	.03	.76	27.87*
Step 2								
Att. anxiety	−.17	.06	−.19	−2.64*	−.03	.03	−.03	−1.21
Att. avoidance	−.43	.07	−.49	−6.49*	−.22	.03	−.23	−7.52*
Step 3								
Memory networks NS	.21	.06	.24	3.39*	.06	.03	.06	2.26*
Step 4								
Att. anxiety X memory networks NS	.12	.059	.14	2.08*	.05	.03	.07	2.01*
Att. avoidance X memory networks NS	.13	.050	.17	2.57*	.04	.03	.06	1.99*

Abbreviations: Att., attachment; NS, need satisfaction;
*$p < .05$.

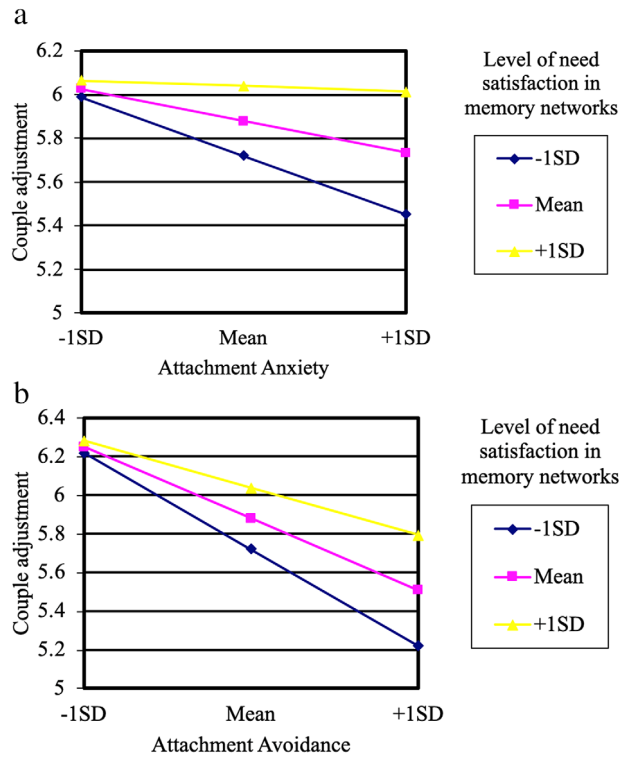

FIGURE 1 (a) Association between attachment anxiety and couple adjustment moderated by need satisfaction in couple-related memory networks. (b) Association between attachment avoidance and couple adjustment moderated by need satisfaction in couple-related memory networks

(+1 *SD*). Thus, it seems that high levels of need satisfaction in couple-related memory networks provide some reduction to the detrimental association between both attachment anxiety and avoidance and couple adjustment.

A second multiple regression analysis was conducted to examine the independent associations of need satisfaction in the main couple-related memory and in the networked memories with couple adjustment. We conducted the same regression analysis as above, but this time, four interaction terms were included: (a) attachment avoidance × main memory need satisfaction; (b) attachment anxiety × main memory need satisfaction; (c) attachment avoidance × networked memories need satisfaction; (d) attachment anxiety × networked memories need satisfaction. Results revealed no significant interaction. Since the combined score showed significant results, it may be that the power of the present study was too low to detect significant results across four moderations. Hence, small effect sizes in this context is unsurprising since only one memory network was assessed and individuals are expected to be influenced by many of them (Philippe et al., 2012). To allow for greater power, we ran the same regressions again, examining attachment moderations by need satisfaction in the main memory and in networked memories separately. As can be seen in Table 3, doing so revealed that moderations of attachment by need satisfaction in the main memory were not significant ($p > .20$). However, moderations by need satisfaction in the networked memories were significant (avoidance × need satisfaction in networked memories, $\beta = .19$, $p = .005$) or marginally significant (anxiety × need satisfaction in networked memories, $\beta = .12$, $p = .076$). Simple effects of these moderations were the same as those presented above for the whole memory network (see Figures S1A and S1B).

In sum, these results provide some support to our hypotheses, although it is unclear whether these were fully or just partially supported, given the lower power to detect multiple significant moderations at the same time. Memory networks do appear to reduce the negative association of insecure attachments with couple adjustment. However, results showed that it was mostly the networked memories associated with the couple-related main memories that were driving this moderation effect. Examination of the main self-defining memories revealed that many were positive and need satisfying ($M = 1.78$, $SD = 1.22$, on a -3 to $+3$ Likert scale) and they were more need satisfying than the networked memories ($M = 1.51$, $SD = 1.14$), $t(152) = 2.74$, $p < .01$. Thus, while the main self-defining memory represents key aspects of the current relationship (Philippe et al., 2013) the networked memories associated with it may represent more core relational- and person-based representations that are more beneficial at buffering the association between insecure attachment and couple adjustment.

8 | STUDY 2

The purpose of Study 2 was to replicate the findings of Study 1 within a larger sample size that would allow us to detect small effect sizes in distinguishing between the main self-defining couple-related memory and networked memories. Moreover, in this study, we controlled for the level of need satisfaction generally experienced in the relationship. This latter control variable is of critical importance to show that the results are specifically due to the level of need satisfaction characterizing specific couple-related memories and their organization in networks and not due to a general abstracted experience of how much individuals perceive that their psychological needs are generally satisfied by their partner within their romantic relationship. As shown in other studies examining other life domains, the level of need satisfaction people generally experience or experience within a given domain is not the same as the level of need

TABLE 3 Multiple regression analyses of insecure attachment on couple adjustment moderated by need satisfaction in a couple-related memory and their networked memories, separately (Study 1)

	Study 1				Study 2			
Independent variables	***B***	***SE***	**β**	***t***	***B***	***SE***	**β**	***t***
Age	.01	.01	−11	−1.14	−.01	.00	−.07	−2.50*
Sex	.07	.18	.03	.39	.05	.06	.02	.79
Relationship duration	−.13	.19	−.06	−.66	−.09	.06	−.04	−1.57
Couple NS in general					.68	.03	.62	19.88*
Att. anxiety	−.17	.06	−.19	−2.64*	−.09	.04	−.09	−2.11*
Att. avoidance	−.43	.07	−.49	−6.49*	−.27	.04	−.28	−6.36*
Main memory NS	.03	.07	.03	.42	.05	.03	.05	1.65
Networked memories NS	.20	.07	.23	2.87*	.02	.03	.02	.50
Att. anxiety X Main memory NS[a]	.07	.07	.07	.98	−.02	.03	−.02	−.74
Att. avoidance X Main memory NS[a]	.05	.06	.06	.88	−.03	.03	−.03	−.85
Att. anxiety X networked memories NS[a]	.10	.06	.12	1.78**	.06	.03	.09	2.16*
Att. avoidance X networked memories NS[a]	.14	.05	.19	2.84*	.07	.03	.09	2.12*

Abbreviations: Att., attachment; NS, need satisfaction.

[a]In Study 1, given the lower power, the interactions with attachment were entered separately for the main memory and the networked memories (but still while controlling for NS main memory and networked memories). In Study 2, all four interaction terms were entered together in the same regression.

*$p < .05$.

**$p < .10$.

satisfaction they experienced in distinct life episodes encoded in memories related to the same domain (Milyavskaya, Philippe, & Koestner, 2013; Philippe et al., 2013). In line with the results of Study 1, it was again hypothesized that need satisfaction in memory networks would moderate the relationship between insecure attachment and couple adjustment, but that this would be especially the case of networked memories. Moreover, as in Study 1, this result should hold even after controlling for common demographics and general need satisfaction in the relationship.

9 | METHOD

9.1 | Participants and procedure

A total of 567 undergraduates and graduates (78.3% females) who were engaged in a romantic relationship for more than 3 months were recruited from a French-Canadian university. Participants' mean age was 25.59 years ($SD = 6.48$). A priori power analysis revealed that to detect small effect sizes of $R^2 = .02$ within a multiple regression analysis with nine predictors at an $\alpha = .05$ with a power of .80, a sample of 539 participants was needed. Procedures were the same as those of Study 1.

9.2 | Measures

9.2.1 | Attachment

The Experience in Close Relationships Short-form scale (Wei et al., 2007) was used again in Study 2. Cronbach alphas were .70 and .71 for the avoidance and anxiety dimensions, respectively.

9.2.2 | Couple adjustment

To ensure a high validity and reliability of the dependent variable, we used the full 21-item version of the Perceived Relationship Quality Components Inventory (Fletcher et al., 2000). In addition, participants also completed the short 4-item Dyadic Adjustment Scale (Sabourin, Valois, & Lussier, 2005). Items of these two scales were all rated on a 7-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. These two scales were highly correlated ($r = .82$, $p < .01$) and were combined in a single score representing couple adjustment ($\alpha = .94$).

9.2.3 | Need satisfaction in the relationship in general

The 9-item Basic Need Satisfaction in Relationships scale (La Guardia, Ryan, Couchman, & Deci, 2000) was used to evaluate the satisfaction of autonomy, competence, and relatedness needs within participants' current romantic relationship in general ($\alpha = .73$). Items were rated on a 7-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. Sample items include "When I am with my partner, I feel loved and valued" (relatedness) and "When I am with my partner, I feel free to be who I am" (autonomy). This scale assesses the level of need satisfaction perceived in general in the romantic relationship, whereas need satisfaction in a couple-related memory assesses the level of need satisfaction experienced in one specific past event related to the romantic relationship. Both measures are typically only moderately correlated (Philippe et al., 2013).

9.2.4 | Self-defining couple-related memories and networked memories

As in Study 1, participants were asked to describe in detail a personal memory of an event that they experienced within their current romantic relationship. Instructions for this couple-related memory and networked memories were the same as those of Study 1 and items to assess need satisfaction in memories were also the same. Alphas for the main memory was .85 and .90 for the networked memories.

10 | RESULTS

Table 1 reports the means, standard deviations, and correlations of all variables of Study 2. As in Study 1, attachment anxiety and avoidance were both negatively correlated with couple

adjustment and with need satisfaction in the couple-related memory network, while the latter was positively associated with couple adjustment. Again, this pattern of correlations was the same for need satisfaction in the main memory and for need satisfaction in the networked memories when they were considered separately. Moreover, as found in previous research (La Guardia et al., 2000), there was a strong positive correlation between need satisfaction in the relationship in general and couple adjustment and negative associations between this former construct and attachment avoidance and anxiety. Need satisfaction in couple-related memory networks and need satisfaction in the relationship in general were only weakly correlated.

The same multiple regression analyses conducted in Study 1 were again used in Study 2, this time adding need satisfaction in the relationship in general as a control variable at Step 1. Results are shown in Table 2. At Step 1, age was negatively associated with couple adjustment, whereas need satisfaction in the relationship in general was strongly and positively associated with couple adjustment. At Step 2, attachment avoidance, but not anxiety, was negatively associated with couple adjustment. At Step 3, need satisfaction in the couple-related memory network was positively associated with couple adjustment.

At Step 4, there were also significant interactions between attachment anxiety and need satisfaction in couple-related memory networks and between attachment avoidance and need satisfaction in couple-related memory networks. Simple effect analyses revealed the exact same pattern as those of Study 1 (see Figures S2A and S2B). Specifically, attachment anxiety was unrelated to couple adjustment when people reported memory networks with a high level (+1 *SD*) of need satisfaction, $B = .028$, $SE = .037$, $\beta = .029$, $t(557) = 0.75$, $p = .45$. However, attachment anxiety was negatively associated with couple adjustment, $B = -.073$, $SE = .037$, $\beta = -.077$, $t(557) = -2.00$, $p = .046$, when the level of need satisfaction in memory networks was low (−1 *SD*). Similar results were obtained for attachment avoidance, as it was strongly negatively associated with couple adjustment when the level of need satisfaction in the memory network was low (−1 *SD*), $B = -.25$, $SE = .035$, $\beta = -.26$, $t(557) = -7.16$, $p < .01$, but much less negatively associated with couple adjustment, $B = -.15$, $SE = .042$, $\beta = -.16$, $t(557) = -3.58$, $p < .01$, when the level of need satisfaction was high (+1 *SD*).

A second multiple regression analysis was conducted to examine the independent associations of need satisfaction in the main memory and in the networked memories with couple adjustment. We conducted the same regression analysis as above, but this time, four interaction terms were included at Step 4: (a) attachment avoidance × main memory need satisfaction; (b) Attachment anxiety × main memory need satisfaction; (c) attachment avoidance × networked memories need satisfaction; (d) attachment anxiety × networked memories need satisfaction. Results (see Table 3) revealed that the interaction terms of the main memory with attachment anxiety and avoidance were non-significantly associated with couple adjustment, $\beta s < |.027|$, $t(554) < |.46|$, *ns*, whereas the interactions between need satisfaction in the networked memories and attachment anxiety and attachment avoidance were significantly associated with couple adjustment. Simple effects revealed very similar patterns to those above (see Figures S3A and S3B). Specifically, attachment anxiety was unrelated to couple adjustment when people reported networked memories with a high level (+1 *SD*) of need satisfaction, $B = .044$, $SE = .040$, $\beta = .046$, $t(554) = 1.10$, $p = .27$, but negatively associated with couple adjustment, $B = -.085$, $SE = .040$, $\beta = -.089$, $t(554) = -2.11$, $p = .035$, when the level of need satisfaction in networked memories was low (−1 *SD*). Attachment avoidance was strongly negatively associated with couple adjustment when the level of need satisfaction in the memory network was low (−1 *SD*), $B = -.27$, $SE = .042$, $\beta = -.28$, $t(554) = -6.36$, $p < .001$, but much less negatively associated with couple adjustment, $B = -.13$, $SE = .048$, $\beta = -.13$, $t(554) = -2.62$,

$p < .01$, when the level of need satisfaction was high (+1 *SD*). Thus, it seems that networked memories is the key variable helping to buffer the negative association of attachment anxiety and avoidance with couple adjustment.

11 | GENERAL DISCUSSION

The present study sought to examine the moderating role of couple-related memory networks on the association between attachment insecurity and couple adjustment. The results suggest that couple-related memory networks, particularly networked memories associated with a main couple-related memory, could buffer the negative association of attachment insecurity with couple adjustment. On the one hand, both attachment anxiety and avoidance were negatively associated with need satisfaction in couple-related self-defining memory network, implying that insecure individuals have access to less need-satisfying memory networks revolving around romantic relationships. On the other hand, insecurely attached individuals who could retrieve need-satisfying networked memories associated with their main couple-related memory had higher couple adjustment than those who only had access to less need-satisfying networked memories. We can speculate that the default mode of insecurely attached individuals' behavioral system, which is deactivation or hyperactivation of their security seeking strategies, are partly blunted by need-satisfying memory networks, which disposes insecurely attached individuals to reassess their couple adjustment through more secure relational memories. Of importance, these results were obtained in Study 2 even after controlling for general perceptions of need satisfaction in the relationship. This particular finding speaks to the particularity of memories and to how they can specifically affect key outcomes independently of traits or general perceptions (Adler, Lodi-Smith, Philippe, & Houle, 2016).

Our study adds credence to previous studies in which need-satisfying memories were linked to the ability to downregulate negative emotions (Houle & Philippe, 2017; Philippe et al., 2018). Recruiting positive or need-satisfying memory networks has been shown to facilitate the self-generation of positive emotions and situational well-being in times of stress (Philippe et al., 2009; Philippe et al., 2012; Philippe & Bernard-Desrosiers, 2017). The present study suggests that need-satisfying memory networks can be recruited to potentially alleviate the negative reactions to separation threats associated with attachment insecurity, thereby sustaining couple adjustment. Experimental studies in which couple-related memory networks are primed could add further support to this claim. Moreover, longitudinal studies are needed to examine whether need satisfying memories can produce stable changes in the behavioral system default mode of insecurely attached individuals.

11.1 | Security-enhancing memories

Overall, our results are in line with previous studies, which found that need satisfying memories led to positive outcomes, such as well-being, relationship quality, and friend satisfaction (Bouizegarene & Philippe, 2018; Philippe et al., 2012, 2013). These studies found that even after taking into account attachment, need satisfaction in memory networks was positively associated with couple adjustment. Moreover, insecure attachments were negatively associated with need satisfaction in memory networks, suggesting that insecurely attached individuals may have access to couple-related memory networks characterized by lower levels of need satisfaction.

This latter result is consistent with the findings that high levels of need satisfaction are associated with attachment security (La Guardia et al., 2000), as high levels of relatedness, autonomy, and competence can boost the sense of security of an individual and a secure attachment can facilitate the satisfaction of these psychological needs within relationships. However, this study showed this association at the level of episodic memories.

Perhaps more importantly, need-satisfying networked memories mitigated the negative associations between insecure attachment dimensions and couple adjustment. Insecure individuals with avoidant or anxious relational schemas will hold negative beliefs on how they should be treated and how they perceive their romantic partners. Anxious individuals hold the negative belief that they are not worthy to be loved, whereas avoidant individuals embrace the negative belief that closeness or emotional involvement is dangerous. In both cases, access to couple-related need-satisfying memories that are security-enhancing lessened the negative association of their anxious or avoidant relational schema with couple adjustment. Instead of exclusively relying on insecure relational schemas in their interactions with their partner, they might also recruit a sense of security from their memories in which they felt high satisfaction for their basic psychological needs. Conversely, need-thwarting memory networks may even increase the negative impact of one's insecure relational schemas, as shown by the fact that insecure individuals who reported such kind of networked memories (i.e., −1 *SD*) had the lowest level of couple adjustment. Interestingly, need satisfaction in couple-related memory network was not beneficial to couple adjustment for individuals with low attachment anxiety and avoidance (see Figure 1). These results further add to the claim that couple-related memory networks may serve as a cognitive resource to sustain romantic relationships for individuals with insecure schemas. Conversely, people with a secure attachment may not need to chronically draw from their memories for further soothing representations. However, these memory networks might play a role, even for securely attached people, when they are facing adversity or significant stress at a certain time in their relationships. Because of the chronic threats that they experience, individuals with anxious or avoidant attachment may more chronically recruit memory networks to sooth their stress. Given the frequent uses of such memory networks, insecure individuals with more need-satisfying memory networks should report greater couple adjustment than insecure individuals with less need-satisfying memory networks, as shown by the current findings. Conversely, securely attached people may only recruit such memory networks when there is a clear situational threat. Given the less frequent uses of their couple-related memory networks, their effect on couple adjustment may be weaker in cross-sectional studies. Such effects might be more easily observed in an experimental study inducing a relational threat, for instance. Future studies are needed to investigate this issue.

11.2 | Networked memories

Another interesting finding of our studies is that when pitted against each other in a multiple regression, networked memories significantly moderated the relationship between both attachment anxiety and avoidance, whereas the main self-defining memory did not. In terms of need satisfaction, the couple self-defining memory mean was higher than the mean of networked memories. This entails that most individuals have access to some need-satisfying memories directly related to their current romantic relationship. Indeed, it would appear incongruous for an individual to remain in a romantic relationship that is uniquely characterized by need thwarting negative memories—probably a very rare situation. Conversely, networked memories

may be about the current relationship or about other past relationships or even other remotely related events (see the illustrative examples provided in Study1). These other memories may affect individuals' current romantic relationship outcomes because they are cognitively linked with current relationship memories. Since these other memories recruit and exemplify other lingering concerns and issues or events of growth and resilience, they are likely to transpire within one's current romantic relationship and influence its outcomes. Access to networked memories that are more need satisfying instead of need thwarting appears to act as a key cognitive resource buffering the negative impact of insecure attachment schemas.

The concept of networked memories therefore appears as a particularly fruitful research avenue to investigate the potential issues and concerns that emerged from past events and that insecure individuals may carry with themselves throughout their lives. Over and above one's attachment schemas, there seems to be a Context (one's current romantic relationship) × memories (past events cognitively linked to one's current romantic relationship) interaction. Changing the context or the memories could result in a change in couple adjustment. For instance, an intervention could focus on context: a partner would become more supportive, which would buffer the influence of existing need thwarting couple-related memories on couple adjustment by creating new need-satisfying couple-related memories in both partners. Conversely, a therapy could focus on memories (e.g., Lane, Ryan, Nadel, & Greenberg, 2015): need thwarting memories could be reappraised as need satisfying by a partner, or they could become aware of (or attribute more importance to) existing need-satisfying couple-related memories, thereby modifying the couple memory networks. This would result in a greater access to security-enhancing memories that could buffer the effects of attachment insecurity on couple adjustment. Worthy of note, this context × memory interaction is reminiscent of the cognitive-affective system theory (Mischel & Shoda, 1995) and future research might do well in integrating both models.

11.3 | Future research and limitations

Our study also presents a number of limitations. First, the design of the two studies was cross-sectional, which prevented us from drawing any conclusion with respect to causality or the direction of the effects observed. Further research would be needed to verify whether couple-related memory networks are stable over time and can lead to changes in couple adjustment or reduce the negative association between insecure attachment and couple adjustment over time. Some evidence points in that direction. Rowe and Carnelley (2003) showed that after being primed with a security-enhancing representation of an attachment figure, participants had more positive expectations toward their current relationship partner's behavior for several days. Because self-defining couple-related memory networks are chronically accessed and frequently activated, they may forge those positive expectations over time, hence, increasing couple adjustment and reducing the negative association between insecure attachment and couple adjustment.

Second, the age and sex of the participants limit the generalization of our results, as participants in both studies were for the most part young female adults. The present findings need to be replicated with a sample recruited from the general population. Third, our study did not include dyads, which limits our understanding of how both partners' couple-related memory networks interact to affect the perceptions of each partner. The recruitment of dyads to examine how memories of relationships can buffer the attachment insecurity of both relationship partners, appears as a fruitful future research avenue. A dyadic study has already shown that a need satisfying couple-related memory in a partner was associated with greater commitment in the

other partner, even after controlling for how the partner remembered that memory (Guilbault & Philippe, 2017). Thus, the way a memory for a couple-event is constructed in one partner's mind may affect their own perceived relationship outcomes, but also the ones of the other partner. This potentially occurs through partner buffering behaviors (Simpson & Overall, 2014) *facilitated* by the activation of couple-related need-satisfying memory networks (i.e., Actor's need-satisfying memory networks → Actor's caring and supporting behaviors → Partner's perceived satisfaction with the relationships). However, future research is needed from a dyadic perspective to better understand the impact of these couple-related memory networks in insecure individuals on the other partner of the romantic relationship prior to promoting the exploration of memories as a potential avenue for intervention with insecure individuals.

Overall, two studies showed that need-satisfying couple-related memory networks could act as a cognitive resource to protect couple adjustment from the negative effects of both avoidant and anxious insecure attachment. When examined separately, it was shown that need satisfying networked memories, but not main memories, moderated the negative association of insecure attachment with couple adjustment. Future research could use dyadic research design to understand the interpersonal dynamics of these associations, and could also employ experimental design to examine precisely how insecurely and securely attached persons use memories to buffer stressful relational situations.

DATA AVAILABILITY STATEMENT

As part of IARR's encouragement of open research practices, the authors have provided the following information: This research was not pre-registered. The data and materials used in the research are available. Both can be obtained by emailing the corresponding author at philippe.frederick@uqam.ca

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ENDNOTES

[1] Couple-related memories are memories related to one's couple romantic relationship. They are typically memories of an event that directly occurred with one's partner, that involves one's partner in thoughts, or that pertains to one's romantic relationship (e.g., buying a house with my partner).

[2] Episodic memories are typically composed of remembered visual images, but also of other sensory inputs (e.g., auditory, olfactory, felt sensations) and are characterized by an experiential component (e.g., emotion, need, goal). Autobiographical memories are the narrated and reconstructed experience of an episodic memory into a tentatively cogent, chronologically coherent, and scripted manner. In this research, since we more specifically focus on the experiential component of memories (i.e., need satisfaction) than their narrated form, we use the term episodic memories.

[3] A memory network is a collection of memories associated with each other based on surface features (e.g., same location, same person, same object, same emotion) or aggregating on a same theme, value, identity self-aspect, or a more abstract representation. When a memory network is considered, there is typically a main memory that associates with other memories, called networked memories.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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