

Flashbulb memories for Paris attacks in an alcohol-abstinent patient

Mohamad EL HAJ^{1*}, Marie-Charlotte GANDOLPHE¹

¹Univ. Lille, CNRS, CHU Lille, UMR 9193 - SCALab - Sciences Cognitives et Sciences Affectives, F-59000 Lille, France

Abstract

Alcohol-dependence has been associated with difficulty to retrieve specific autobiographical memories. Our paper investigated whether this difficulty is also observed for flashbulb memories in an alcohol-abstinent patient. Using a directed interview technique, we assessed flashbulb memories for the Paris attacks in a patient who had been abstinent for two years. Our patient demonstrated reliable recall of event memory (i.e., the attacks). He also provided fair details about how he first became aware of the attacks (i.e., high flashbulb memories). Our patient also succeeded to answer questions about where he was, with who he was, and what day of the week/time it was when he first learned about the attacks. Moreover, the patient demonstrated fair subjective reliving. Together, flashbulb memories seem to trigger high recall as well as extensive reliving in alcohol-abstinent subjects, at least in our participant.

Introduction

Alcohol-dependence has been associated with memory compromise, a compromise that has been observed for working memory [1-5], for memory for verbal or nonverbal stimuli [6-8], and for source memory, i.e., the ability to remember the context in which an event occurred [9,10]. Interestingly, autobiographical memory, or memory for personal experiences, has been also found to be compromised in alcohol-dependence. A main characteristic of the compromise of autobiographical memory in alcohol-dependence is overgenerality: instead of recalling localized events in time and space, patients with alcohol-dependence tend to produce general memories (e.g., categorical summaries of repeated events or extended events in time) [11,12]. Autobiographical overgenerality in alcohol dependence have been attributed to compromise of executive dysfunction [13,14], as well as to emotional avoidance strategies that limit exposure to emotional charge that is associated with memories [15-17]. Autobiographical overgenerality in alcohol-dependence can be linked with compromise of the subjective reliving of memories. This compromise was observed by Pitel, Beaunieux [18] who used the Remember/Know paradigm [19] in recently detoxified alcoholic participants. Participants had to provide a "Remember" response if they remembered the specific episode in which items were previously encountered with the impression of reliving some of the details. Alternatively, they had to provide a "Know" response if they knew that they had encountered the items but did not remember any specific event or detail. Results showed fewer "Remember" responses in the alcoholic participants than in controls, suggesting compromise of subjective reliving of the past.

Considering the autobiographical compromise in alcohol-dependence, our paper investigated whether this compromise would also be observed for flashbulb memories in alcohol abstinence. Flashbulb memories are detailed, vivid and long-lasting autobiographical memories of attributes of the reception context of surprising and emotionally arousing public events [20]. Mirroring this definition, people tend to demonstrate significant recall of attributes of the reception context (e.g., where they were when the event occurred,

their ongoing activities, who informed them about the event, their reactions and those of the informant) for a wide range of emotional and surprising public events, such as the attacks of September 11 2001 in the United States [21-27] and a wide variety of other events [28-31]. In our paper, flashbulb memories were assessed for the Paris attacks, a series of coordinated terrorist attacks perpetrated in Paris on the evening of Friday 13 November 2015. Three suicide bombers struck near the Stade de France, followed by suicide bombings and mass attacks at cafés, restaurants and a music venue in central Paris. The attackers killed and injured 130 and 368 people, respectively. The attacks were the deadliest in France since World War II. Directly after the attacks, France was placed on high alert and a state of emergency was declared.

Building upon the previous research, our paper investigated flashbulb memories in an alcohol-abstinent patient. The case study design was implemented due the number of variables that were considered: our study assessed event memory, flashbulb memory, as well as subjective reliving of flashbulb memories (i.e., vividness, rehearsal, emotion, surprise, novelty, and importance). The latter characteristics were implemented following research on flashbulb memories in normal subjects [20,32-34] as well as the Autobiographical Memory Questionnaire [35] which was designed to evaluate autobiographical reliving. Because studies with long abstinence duration suggest that recovery or substantial improvements in memory functions can occur [7,36-38], it would be of interest to assess whether flashbulb memories would trigger high recall as well as extensive reliving in alcohol abstinence. To the best of our knowledge, no published studies have assessed flashbulb memories in alcohol-dependence.

Correspondence to: Mohamad EL HAJ, Université de Lille 3, Département de Psychologie, Domaine du Pont de Bois, B.P 60149. 59653, Villeneuve d'Ascq, France, E-mail: mohamad.elhaj@univ-lille3.fr

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Method

Participants

The study involved a patient with an alcohol-abstinent patient. Mr. C is a male, high-school graduate, right-handed, French native-speaker, living in his own homes with his wife and had been abstinent for two years. He was 50 years old and had an 8-year history of worsening alcohol abuse. He reported no history of strokes, seizures or head injury. He was recruited from the addiction department of the Hospital Center in Hénin-Beaumont in Northern France because he met the DSM IV-TR criteria [39] for alcohol dependence. Prior to participation, Mr. C provided his written informed consent in accordance with the Declaration of Helsinki.

Cognitive assessment

To screen his cognitive functioning at the time of study, Mr. C was administered a battery assessing general cognitive functioning, episodic memory and working memory.

- General cognitive functioning was assessed with the MoCA [40], a 30-point cognitive screening test that evaluates attention, orientation, language, verbal memory, visuospatial and executive function. Mr. C obtained 29 points.

- Episodic memory was evaluated with a French version of the selective reminding task of Grober and Buschke [41]. Mr. C had to retain 16 words, each of which describes an item that belongs to a different semantic category. Immediate cued recall was succeeded by a distraction phase, during which the participant had to count backwards from 374 in 20 s. This distraction phase was succeeded by two minutes of free recall and the score from this phase provided a measure of episodic recall (16 points maximum). Mr. C correctly remembered 14 words.

- To evaluate working memory, Mr. C had to repeat a string of single digits in the same order (i.e., forward span) or in the reverse order (i.e., backward span). The forward and backward spans of Mr. C were eight and five, respectively.

Flashbulb memory assessment

Flashbulb memory was assessed using a directed interview technique. The interview included questions on event memory, flashbulb memory, vividness, rehearsal, emotion, surprise, novelty and importance. Event memory was assessed with four questions concerning general information about the Paris attacks: the date, time and location of the attacks, while the fourth question was a free-response question. Flashbulb memory was assessed with six questions concerning the context in which the participants first learned of the attack. Vividness was assessed with three questions about visual imagery, auditory imagery and mental time travel (ranging from “not at all” to “extremely”). Rehearsal was assessed with three questions about following media coverage, ranging from “never” to “everyday”. Emotional valence was assessed with one question ranging from “very negative” to “very positive”, and emotional state was assessed with one question about different feelings (e.g. sadness, confusion, frustration etc.). Surprise and novelty were assessed with one question each. Finally, appraisal of importance was assessed with questions on which participants rated to what extent the event was important to themselves, families/friends, the country, and the international community (ranging from “not at all important” to “very important”). The interview and answers of both participants are transcribed below.

The interview

Event memory

- On what date (day/month/year) did the attacks occur?

Mr. C: 13 November 2015

- At what time did the attacks occur?

Mr. C: 10 or 10:30 at the evening

- Where did the attacks occur?

Mr. C: in the center of Paris, the Bataclan (*a concert venue*, our add), and also in several bars

- Do you remember anything else about the attacks?

Mr. C: the attacks also occurred at the Stade of France, there were many innocent people who were injured or killed

Flashbulb memory

- Please describe how you first became aware of the attacks (radio, television, friend etc.)

Mr. C: I was watching a football match on the TV, the match where the attacks took place, so I watched the reaction of people to the attacks, then I switched channel to watch the rest of the attacks. I was worried because my son lives in Paris and he usually goes out on Friday evening. I sent him an SMS...without any answer till midnight when he finally sent me a SMS to tell me that he was ok...his mobile was turned off because he was watching a movie in the cinema and he was not able to receive my message. He did not know about the attacks till the end of the movie.

- Please describe where you were when you learned about the attacks

Mr. C: I was at home

- Please describe who you were with when you learned about the attacks

Mr. C: I was with my wife

- Please describe what you were doing when you learned about the attacks

Mr. C: watching TV

- What day of the week was it when you first learned about the attacks?

Mr. C: Friday

- What time was it when you first learned about the attacks?

Mr. C: 10 or 10:30 when the attacks began

Vividness

- When you think about the moment when you first learned about the attacks, do you see this moment in your mind? (not at all, a little, moderately, quite a bit, extremely)

Mr. C: extremely

- When you think about the moment when you first learned about the attacks, do you hear this moment in your mind? (not at all, a little, moderately, quite a bit, extremely)

Mr. C: extremely

- When you think about the moment when you first learned about the attacks, do you feel that you are travelling back to the time it happened? (not at all, a little, moderately, quite a bit, extremely)

Mr. C: extremely

Rehearsal

- Since the announcement of the attacks, how closely have you followed the media coverage? (never, once, once a week, many times a week, every day)

Mr. C: every day

- Since its announcement, how many times have you thought about the attacks? (never, once, once a week, many times a week, every day)

Mr. C: every day

- Since its announcement, how many times have you talked about the attacks? (never, once, once a week, many times a week, every day)

Mr. C: many times a week

Emotion

- Generally speaking, how do you evaluate your emotional reaction when you first learned about the attacks? (very negative, negative, neutral, positive, very positive)

Mr. C: very negative

When you first learned about the attacks, you were:

- (not at all shocked, a little shocked, moderately shocked, quite a bit shocked, very shocked)

Mr. C: very shocked

- (not at all confused, a little confused, moderately confused, quite a bit confused, very confused)

Mr. C: a little confused

- (not at all sad, a little sad, moderately sad, quite a bit sad, very sad)

Mr. C: a little sad

- (not at all angry, a little angry, moderately angry, quite a bit angry, very angry)

Mr. C: a little angry

- (not at all afraid, a little afraid, moderately afraid, quite a bit afraid, very afraid)

Mr. C: a little afraid

- (not at all anxious, a little anxious, moderately anxious, quite a bit anxious, very anxious)

Mr. C: quite a bit anxious

- (not at all disappointed, a little disappointed, moderately disappointed, quite a bit disappointed, very disappointed)

Mr. C: very disappointed

- (not at all insecure, a little insecure, moderately insecure, quite a bit insecure, very insecure)

Mr. C: very insecure

- (not at all frustrated, a little frustrated, moderately frustrated, quite a bit frustrated, very frustrated)

Mr. C: very frustrated

Surprise

- When you first learned about the attacks, you were (not at all surprised, a little surprised, moderately surprised, quite a bit surprised, very surprised)

Mr. C: moderately surprised

Novelty

- According to you, this event is (very unusual, a little unusual, moderately unusual, quite usual, very usual)

Mr. C: very unusual

Importance

- Is this event important to you? (not at all important, a little important, moderately important, quite a bit important, very important)

Mr. C: very important

- Is this event important to your family/friends? (not at all important, a little important, moderately important, quite a bit important, very important)

Mr. C: very important

- Is this event important to your country? (not at all important, a little important, moderately important, quite a bit important, very important)

Mr. C: very important

- Is this event important to the international community? (not at all important, a little important, moderately important, quite a bit important, very important)

Mr. C: very important

Discussion

This study investigated flashbulb memories for the Paris attacks in an alcohol-abstinent patient. Our patient demonstrated reliable recall of event memory, extensive flashbulb memories, and critically, fair subjective reliving.

Our findings are of interest as they suggest that alcohol-abstinent patients may demonstrate fair flashbulb memories. Our patient was able to provide fair details about how he first became aware of the attacks. He also succeeded to answer the questions about where he was, with who he was, what day of the week/time it was when he first learned about the attacks. Hence, our patient was able to demonstrate specific autobiographical memory for the context in which he first learned about the attacks, suggesting high recall of flashbulb memories in alcohol-abstinence. These findings may mirror research suggesting that when assessing personal memories with high emotional valence, patients with alcohol-dependence may subjectively experience as many sensory and contextual details as controls [14]. Also, overgenerality bias is less observable when individuals are abstinent for a longer period (more than 6 months) than in recently detoxified patients (about 15 days) [13], which may explain why Mr. C (abstinent for two years) was able to retrieve specific memories.

As we tend to suggest, the high recall of flashbulb memories in our participant may be attributed to the long abstinence period. The episodic and working memory performances of Mr. C were relatively normal. These outcomes fit well with studies demonstrating improvement or even complete recovery to normal performance after long abstinence periods in several cognitive domains, including verbal IQ, verbal fluency, short-term memory, and episodic memory [38,42,43]. A study has assessed episodic memory and executive function in alcoholics over a six-month abstinence period at baseline and at six-month follow-up [7]. The study found that at the follow-up, the abstainers' episodic memory and executive performances had returned to normal. Furthermore, using structural Magnetic Resonance Imaging, a study has found an increase in hippocampal volume positively correlated with memory improvement in abstinent patients [42], since the hippocampus is critically involved in memory functioning [44-46], this may indicate a biomarker for improved memory functions in abstinence. Together, studies with long abstinence duration suggest significant improvement in memory; our study contributes to this literature by demonstrating high flashbulb memory recall in our participant.

Mr. C did not only demonstrate high recall of the context in which he first learned about the attacks, but also fair subjective reliving. More specifically, he has attributed high vividness to his recall, he reported fair rehearsal and described the attacks as very negative, and he associated his recall with fair feelings, especially shock, disappointment, insecurity, and frustration. Thus, flashbulb memories seem to trigger extensive reliving in alcohol-abstinent patients, at least in our participant. This is of relevance as subjective reliving of autobiographical memory has been found to be compromised in alcohol-dependence [18,47,48].

On a clinical level, autobiographical overgenerality are likely to maintain emotional difficulties in alcohol-dependent patients by increasing the emergence of ruminative thinking and by reinforcing the use of maladaptive emotion regulation strategies. For instance, in an attempt to regulate emotion evoked by memories, patients consume more alcohol; thus, autobiographical overgenerality may impede the rehabilitation of alcoholic patients. These clinical considerations underline the importance of our findings as our patient has succeeded to provide not only specific memory, but also a memory that is not related to alcohol-consumption or ruminative thinking. In our view, these findings are of particular interest because specific autobiographical memory training programs have never been developed in alcohol-dependence. Note however that this kind of programs has been associated with fewer depressive symptoms in schizophrenic patients, as well as with a decrease in hopelessness and an increase in life satisfaction in depressive patients [49].

In closing, our study reveals a positive effect of flashbulb memories on recall of reception context of the Paris attacks in an alcohol-abstinent patient. Our paper also demonstrates extensive subjective reliving of flashbulb memories in the patient. By doing so, our work provides an alternative to the traditional view of (the overgeneral) autobiographical memory in alcohol-dependence.

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