

Autobiographical Memory in Major Depression: A Comparison between First-Episode and Recurrent Patients

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Key Words

Autobiographical memory · Recurrent depression · First depressive episode · Recall · Emotion

Abstract

Autobiographical memory in depression is characterized by an increase in general memory evocation. The aim of this study is to compare autobiographical memory in patients with a first depressive episode and in recurrent patients before and after recovery, using Williams' and Scott's autobiographical memory test. Our results show an increase of the number of general memories only with positive cue words in both groups of patients during the depressive episode. After clinical improvement, this specificity remains in recurrent patients who, in addition, recall more general memories for negative words. By contrast, patients with a first depressive episode are no longer different from controls. These results show both an overgeneralization and a deficit in positive memory access during the depressive episode, whatever the number of previous episodes. Moreover, recurrence chronically modifies access to emotional memories.

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Introduction

At adult age, major depressive episodes recur at ever decreasing intervals. Since recurrent patients show chronic symptoms, a worsening of cerebral dysfunction and a resistance to pharmacotherapy [Basso and Bornstein, 1999; Segal et al., 1996; Post, 1992], major depressive episodes can lead to chronic psychiatric disorders.

Among the cognitive deficits observed in depression, several reviews reported concordant memory impairments [Burt et al., 1995; Kindermann and Brown, 1997] that increase with depression severity [Bornstein et al., 1991; Merinkangas et al., 1994]. Nevertheless, not all depressed patients have similar memory deficits. Changes in memory functioning depend on the clinical state of the depression, and recurrent major episodes could be related to increased memory impairments. Moreover, acquisition and retention of information appear to remain unaffected whereas retrieval seems impaired [Basso and Bornstein, 1999].

Autobiographical memory consists of the recall of events related to one's own life and belongs to the episodic memory category [Tulving, 1983]. Autobiographical memories have been characterized by a three-level hierarchical organization: the first level corresponds to long

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0254-4962/02/0356-0335\$18.50/0

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periods of life measured in years or decades; the intermediate level corresponds to general memories, such as repeated events distributed in time, measured in days, weeks or years, and the third level corresponds to rare and specific events measured in minutes or hours [Conway and Bekerian, 1987; Kolodner, 1983]. Such a hierarchical organization leads to the distinction between general and specific memories on the basis of the frequency of events. The general memories, at the intermediate level, can be considered as the most natural entrance for autobiographical memories [Barsalou, 1988]. They are distinct from specific ones (third level) according to the patient's level of education. Finally, the first level provides the overall architecture of autobiographical memories in defining periods of life [Conway and Bekerian, 1987]. When remembering events, one thus activates simultaneously three kinds of knowledge. Autobiographical memories do not correspond to a unique representation stocked in episodic memory [Tulving, 1983; Squire and Zola, 1998], but rather to a collection of processes activated or reconstructed during a specific task [Conway and Rubin, 1993; Schacter, 1996].

A well-known aspect of memory functioning in depressive states is overgeneral memory. In the case of autobiographical memory, depressed subjects recall a whole period of their life when they have to retrieve a specific life event that occurred at a precise moment, whereas healthy subjects are able to recall specific memories easily. Overgeneral recall of autobiographical memory has been observed in depressed patients and in suicidal patients [Williams and Scott, 1988; Puffet et al., 1991; Brittlebank et al., 1993; Kuyken and Brewin, 1995; Brewin et al., 1999]. Usually, negative cues help depressive patients to recall specific autobiographical memories, whereas positive cues alter depressive patients' recall of specific memories [Puffet et al., 1991; Neshat-Doost et al., 1998; Brewin et al., 1999]. When given a cue word, depressive patients' recall is characterized by a general response related to a class of events rather than to a precise event. The troubles in recalling specific memories have been interpreted in different ways: a dysfunction in the encoding stage, a performance at too superficial a level, or a dysfunction in the retrieval stage, i.e. an interruption before the specific memory is reached [Puffet et al., 1991]. Such troubles have also been identified as one of the three variables which predict recurrence or persistence of depression with dysfunctional attitudes and neuroticism [Scott et al., 1995]. According to these authors, this memory dysfunction could be specific to a recovery retardation, making the patient unable to associate events, emotions and

behaviors. Different studies have already underlined that distinct processes are involved in a first depressive episode and in recurrent episodes in an adult population [Teasdale, 1988] or in adolescents [Lewinsohn et al., 1999]. They suggest that the relationships between depressogenic information-processing styles and dysphoric affect is stronger in patients who have already experienced a depressive episode than in those with a first depressive episode.

We think that recurrent major depressive episodes may contribute to the reinforcement of cognitive impairments and further the development or maintenance of memory dysfunctions. With repeated episodes, as Post [1992] has proposed, sensitization to stressors and episode sensitization take place. The 'kindling model' of seizure activity and stimulant-induced behavioral sensitization explains why the episodes become more spontaneous and more independent from the environmental contingencies. This model predicts that each episode becomes more autonomous with each depressive experience. These observations suggest that recurrent episodes may be related to specific memory deficits, determined by the repetition of the disease and the greater 'autonomy' of the episodes [Post et al., 1996].

The aim of the present study was to test whether deficits in autobiographical memory evolve with the repetition of the episodes. Autobiographical memory in patients with a first major depressive episode and in patients with recurrent depressive episodes was assessed before and after clinical improvement, with the autobiographical memory test elaborated by Williams and Scott [1988], adapted for the French by Puffet et al. [1991]. We hypothesized that during depressive episodes the same autobiographical memory deficit, i.e. an increase of general positive memories, will be observed whatever the number of previous episodes. After treatment and clinical improvement, we hypothesized that recurrent patients would not improve while patients with a first depressive episode would recall less general memories, whatever the cues, just like the control subjects.

Methods

Subjects

Thirty-two inpatients were selected according to the DSM-IV criteria of major depressive episodes of at least one month duration. All the patients were hospitalized and treated with antidepressant medication. Their minimum scores on the depressive scales were 19 on the Hamilton [1960] depression rating scale (HDRS).

Table 1. Characteristics (mean $\pm$ SD) of the participants before treatment and after clinical improvement

	Number		Age, years		ERD		HDRS	
	d0	d28	d0	d28	d0	d28	d0	d28
1st Episode	16	13	34.4 $\pm$ 14.3	36.7 $\pm$ 14.5	25.6 $\pm$ 4.9	11.1 $\pm$ 6.3	26.6 $\pm$ 4.7	9.6 $\pm$ 5.3
Recurrent	16	11	44.9 $\pm$ 12.3	40.6 $\pm$ 13.8	27.6 $\pm$ 7.4	12.8 $\pm$ 5.2	25.5 $\pm$ 4.7	10.1 $\pm$ 4.9
Controls	16	–	41.7 $\pm$ 14.0	–	8.2 $\pm$ 3.1	–	5.7 $\pm$ 2.5	–

d0 = Day 0; d28 = day 28; ERD = scores on Widlöcher's psychomotor retardation scale; HDRS = scores on Hamilton's depressive rating scale.

Sixteen patients were recurrent depressives who had presented at least 3 previous major episodes. Recurrence implies the return of a completely new episode after clinical recovery [Mueller and Leon, 1996]. Sixteen patients presented a major depressive episode for the first time and were treated with antidepressant drugs on admission.

Depression was assessed with the HDRS, and severity of psychomotor retardation by Widlöcher's [1983] retardation scale (ERD). Patients were examined twice: upon admission to hospital (day 0) and when discharged about 4 weeks later (day 28), after antidepressant treatment and a clinical improvement (associated to a minimal improvement on depressive scales of 50%; see table 1 for the group descriptions). For the second assessment, 10 patients out of the 16 of the first session for the first depressive episode group and 11 patients out of 16 for the recurrent group were tested.

A control group of 16 subjects, without any history of psychiatric illness, was matched for age, gender and socio-economic status.

The ages of the subjects do neither differ between groups (Kruskal-Wallis test; day 0: $K = 3.73$, $p = 0.16$; day 28: $K = 0.94$, $p = 0.62$); nor between scores and the clinical scales for the groups of depressed patients (Mann-Whitney U-test; day 0 HDRS: $z = 0.36$, $p = 0.72$; ERD: $z = -0.09$, $p = 0.92$; day 28 HDRS: $z = -0.49$, $p = 0.62$; ERD: $z = -1.25$, $p = 0.21$).

Exclusion criteria were: age >65 years, neurological disorders, comorbid posttraumatic stress disorders, intellectual deficits and a recent history of drugs or alcohol abuse. Axis II of the DSM-IV, related to personality disorders, was not assessed.

Measurements

Autobiographical memory was assessed with the Williams and Scott memory test [Williams and Scott, 1988]. We used the French translation of Puffet et al. [1991]. This test includes 20 cue words: 10 with a negative valence and 10 with a positive one. Positive and negative words are read alternately. Subjects are asked to evoke specific memories in response to the cue word. Subjects have 60 s to give their response. Specific memories correspond to a precise particular event (example: to the cue 'hurt', the memory of the mother's death is a specific memory). By contrast, general memory corresponds to a general class of events (example: to the cue 'happy', the response 'I had a happy childhood' is considered a general memory).

Data Analysis

Each subject has three possible ways of responding to each cue word: either she/he gives a specific response, a general one, or no

response at all. The number of no responses was too small (less than 1, on average, for each group) to be taken into account. Thus the number of general responses was normalized by the total number of responses for each subject. The percentage of general responses:

$$\frac{\text{number of general responses}}{\text{number of general responses} + \text{number of specific responses}} \times 100$$

was thus taken as measurement.

Kruskal-Wallis nonparametric analysis of variance was used to assess differences between groups for positive and negative cue words at both day 0 and day 28. When a general difference was observed between groups, multiple comparison was computed on the basis of average rank differences [Siegel and Castellan, 1988].

Results

The percentage of general responses for first and recurrent episode patients compared to controls at day 0 and day 28 are depicted in figure 1.

Before Treatment: Day 0

The percentage of general responses differed significantly between groups for positive cue words ($K = 16.08$, $p < 0.001$), but not for negative ones ($K = 3.93$, $p = 0.14$). Multiple comparisons were thus performed only for the positive cue words. Both depressed groups had a percentage of general responses significantly higher than that of controls, but they did not differ from each other (table 2).

After Clinical Improvement: Day 28

The percentage of general responses differed significantly between the two groups for both positive and negative cue words ($K = 11.85$, $p = 0.003$; $K = 7.41$, $p = 0.02$, respectively). Multiple comparisons were thus performed for both positive and negative cue words.

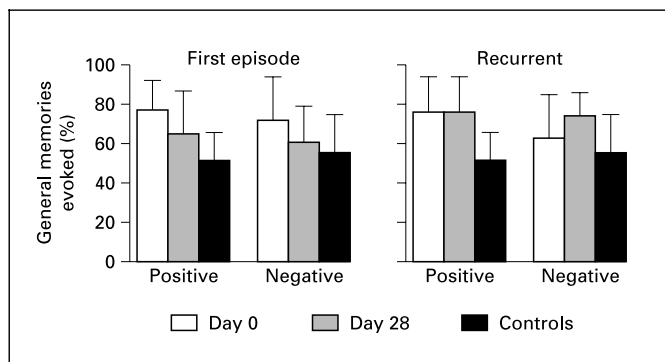


Fig. 1. Mean percentages of general memories evoked with the positive or the negative cue words for the recurrent and first depressive episode groups before treatment (day 0) and after clinical improvement (day 28) compared with controls.

Table 2. Statistical results for the multiple comparisons based on average rank differences for positive cue words before treatment (Val+ day 0) and for positive and negative cue words after treatment (Val+ day 28, Val- day 28, respectively)

	Val+ day 0	Val+ day 28	Val- day 28
1st episode	(R) = 30.81	(R) = 21.85	(R) = 19.58
Recurrent	(R) = 29.63	(R) = 29.09	(R) = 28.27
Controls	(R) = 13.06	(R) = 13.50	(R) = 15.91
1st episode vs. recurrent	p = 0.41	p = 0.07	p = 0.03
Controls vs. 1st episode	p < 0.001	p = 0.03	p = 0.20
Controls vs. recurrent	p < 0.001	p < 0.001	p = 0.004

(R) = Average rank for group.

After clinical improvement, depressed patient groups were no longer similar (table 2): recurrent patients gave significantly more general responses than first-episode patients for negative cue words, and a tendency in the same direction was observable for positive cue words. When compared with controls, first-episode patients gave a higher percentage of general responses for positive cue words, and a similar response for negative ones. One can nevertheless qualitatively observe (fig. 1) that responses of first-episode patients are comparable to those of controls after the 28-day interval. Recurrent patients still gave a higher percentage of general responses than controls for both positive and negative cue words. A qualitative analysis of figure 1 does not reveal any clear change in recurrent patients between day 0 and day 28.

Discussion

Our results confirm the presence of an autobiographical memory deficit during depressive episodes, whatever the number of previous episodes. This impairment is characterized, as previously observed in the literature, by an increase of general responses for positive memories during a depressive episode [Williams and Scott, 1988; Puffet et al., 1991]. Nevertheless, we did not observe any difference in evocation of negative memories at day 0. These results underline that it is mainly the access to positive memories which is impaired in depressed patients. Our results are concordant with the data of Puffet et al. [1991], who showed that depressive patients need more time than controls to respond to the positive cue words, while no difference was observed for the negative ones. The lack of a difference for the negative cue words could be explained by the congruence between the prevalent mood of the patients and the stimulus-affected valence that biases the retrieval processes [Bower, 1981; Teasdale and Barnard, 1993]. Moreover, such a bias is particularly observed when recollection or retrieval is intentional and conscious [Danion et al., 1995].

After clinical improvement, the deficit in autobiographical memory in the recurrent patients group is applicable to both positive and negative memories. By contrast, this phenomenon does not exist in patients with a first depressive episode, and their performance approaches that of controls.

Such differences between the two groups of patients can be explained neither by the severity of depression or psychomotor retardation (since no clinical variables differentiate the two depressed groups), nor by age difference, since there was no significant difference between our two groups of patients, before or after treatment.

Brewin et al. [1999], contrary to the previous assumption of Brittlebank et al. [1993], have shown that the score of overgeneral memories is not predictive of recurrence, but rather is related to effects of previous experiences. As our results demonstrate, the importance of overgeneral memory in depressed subjects depends on the recurrence of depressions. These observations are in accordance with Post's kindling model [1992], suggesting that specific memory deficits in recurrent patients are determined by the frequency of disease episodes and the greater 'autonomy' of these episodes [Post et al., 1996]. Our results also show that differences in autobiographical memory between the two groups of depressed patients are observed only after the remission of the depressive episode. Persistent abnormal autobiographical memory performance is

associated with recurrent depression, whereas memory deficits are less stable and prominent in patients with a first depressive episode. These results reinforce those of Basso and Bornstein [1999] and Beats et al. [1996], who underlined that memory dysfunction varies as a function of recurrent depressive episodes.

The specificity of recurrent-episode patients has also been demonstrated on the basis of biological indices. On the one hand, nonlinear dynamical analyses of brain electrical activity have shown a global difference between first-episode and recurrent-episode patients [Nandrino et al., 1994; Pezard et al., 1996]. Brain dynamics differ according to the number of previous depressive episodes: the complexity of brain electrical dynamics of patients with first depressive episodes recover controls' levels after clinical improvement, whereas those of recurrent patients do not. These results showed that the complexity of the dynamics decreases with the repetition of depressive experiences and diminish the adaptive abilities [Pezard et al., 1996]. Such results could confirm the existence of stable attractors specific to the depressive state and its chronic forms [Globus and Arpaia, 1994]. On the other hand, structural brain imaging studies in major depression have shown hippocampal atrophy [Krishnan et al., 1991], which could imply memory deficits. Moreover, hippocampal abnormality occurs mainly in recurrent patients [Basso and Bornstein, 1999] and depends on the duration of the depression [Sheline et al., 1996]. These results show that episode duration and frequency are two major elements inducing functional abnormalities in depressed patients.

On the basis of our results, the hypothesis that stable beliefs and stable memories predispose vulnerable subjects to depression, as claimed by cognitive theories of depression, is not confirmed. Cognitive symptoms, such as memory deficit or negative memories recall, covary with other depressive symptoms, and particularly with mood. This idea, concordant with the mood-state hypoth-

esis [Persons and Miranda, 1992; Miranda and Gross, 1997], stresses that latent cognitive structures may require activation. Nevertheless, these mood-state effects occurred only in subjects with previous episodes of depression, and not in healthy controls [Persons and Miranda, 1992]. For example, the study of Mackinger et al. [2000], which holds that autobiographical memory deficit is a consequence of depression, shows that women with a history of major depression retrieved more categoric descriptions with the negative cue words than women without any history of depressive episodes. Our results confirm that cognitive dysfunction depends upon previous experiences of depression.

Our study focused on autobiographical memory and its results cannot be directly generalized to other types of memory, e.g. working memory or explicit memory. Moreover, the alteration of cognitive functions in depression [Basso and Bornstein, 1999], such as concentration or executive processes, can explain the global memory alteration observed here, since no other external measurements of mnesic processes were recorded.

In conclusion, our observations emphasize that recurrent patients and those with a first episode do not recover similarly, despite a similar clinical improvement. Cognitive impairments resulting from recurrence are thus barely assessed with the classical rating scales such as Hamilton's or Montgomery and Ashberg's. Other clinical tools are necessary to depict both the degree of cognitive impairment and the cognitive skills available for a clinical improvement in recurrent depressed patients. Moreover, we have shown that the recurrence of episodes modifies access to emotional memories in depressed patients: their cognitive performance is directly related to their previous experiences. A distinction between early forms of depression and recurrent forms thus needs to be considered systematically during cognitive assessment and follow-up of these patients.

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