



True and false autobiographical memories in schizophrenia: Preliminary results of a diary study

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ABSTRACT

The frequency of true and false autobiographical memories and associated states of conscious awareness, i.e., conscious recollection and simply knowing, as well as the respective roles of affective and cognitive processes in autobiographical memory construction, were assessed in eight patients with schizophrenia and eight control participants. A diary study methodology was used in combination with the Remember/Know procedure. The results showed a higher frequency of Know responses associated with the retrieval of both true and false memories in patients than in control participants. Whereas control participants rated higher at retrieval than at encoding the distinctiveness and personal importance of events, as well as the extent to which events furthered current personal plans, patients exhibited an opposite pattern of ratings, with ratings being lower at retrieval than at encoding. These preliminary results show a high frequency of simply knowing associated with the retrieval of true and false autobiographical memories in patients with schizophrenia and provide evidence for the interest of the diary study methodology for studying autobiographical memory in schizophrenia.

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1. Introduction

Cognitive deficits are now considered to be core symptoms of patients suffering from schizophrenia to such a general extent that virtually all cognitive functions are regarded as defective. However, cognitive functions are not equally disturbed. Recent meta-analyses and reviews of cognitive impairments in schizophrenia (e.g., Heinrichs and Zakzanis, 1998; Aleman et al., 1999; Touloupoulou and Murray, 2004) have consistently shown that, along with attention and executive functions, episodic memory, i.e., memory for personal episodes, is particularly impaired. These impairments have been consistently demonstrated in free-recall, cued-recall, and, to a lesser degree, recognition tasks (Aleman et al., 1999).

Recent approaches to memory make a distinction between episodic and autobiographical memory (Conway, 2001). Episodic memory is now viewed as a memory system that retains knowledge of recent episodes over retention intervals measured in minutes and hours, whereas autobiographical memory retains knowledge of personal events and facts over retention intervals measured in weeks, months, years, and across the life span. There is converging evidence that autobiographical memory is impaired in patients with

schizophrenia. Their ability to recall personal events and facts from their lives is reduced (Feinstein et al., 1998; Riutort et al., 2003). Moreover, they recall few specific autobiographical memories (Riutort et al., 2003; Wood et al., 2006; Neumann et al., 2007; Warren and Haslam, 2007). Poorest performance in autobiographical memory tasks was observed in late adolescence and early adult periods, while the childhood period was the least impaired (Feinstein et al., 1998; Elvevag et al., 2003; Riutort et al., 2003). This impairment has been hypothesized to be related to defective memory processes, both at encoding and retrieval.

Recent studies of schizophrenia have investigated the subjective states of conscious awareness associated with the retrieval of autobiographical memories. In normal people, autobiographical memories may be associated with two kinds of awareness, conscious recollection and simply knowing (Conway and Pleydell-Pearce, 2000). Conscious recollection is the experience of traveling through subjective time and mentally reliving past events. In contrast, the subjective experience of simply knowing is the mere knowledge that a personal event happened, but without any conscious recollection accompanying such knowledge. These states of memory awareness may be assessed using an autobiographical memory task combined with an experiential, first-person approach, in which conscious recollection and simply knowing are operationally defined in terms of the Remember/Know procedure (Conway et al., 1996). In this procedure, originally proposed by Tulving (1985), the subjects are

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asked to report their subjective state of awareness at the time they retrieve each individual autobiographical memory. They are instructed to give a Remember response if retrieval is accompanied by conscious recollection, that is, if recall or recognition brings back to mind something they experienced at the time of the event, such as highly specific sensory-perceptual, spatial, and temporal details. The subjects are instructed to give a Know response if retrieval is accompanied by the experience of simply knowing in the absence of any conscious recollection. Using such an approach, Danion et al. (2005) and Cuervo-Lombard et al. (2007) recently showed that there is a reduction of the frequency of conscious recollection in autobiographical memory of patients with schizophrenia, and an increase in the frequency of simply knowing.

Because they use retrospective autobiographical enquiries, all previous studies of autobiographical memory in schizophrenia suffer from two major limitations. First, previous studies of autobiographical memory in schizophrenia do not allow for an assessment of the role of affective processes, which are severely disturbed in schizophrenia (Taylor and Liberzon, 1999), at the time of the event and later at remembering. Patients with schizophrenia report higher anhedonia, show more negative emotions in real-life event studies, and, in evocative studies, report a similar degree of pleasantness and a similar or higher degree of unpleasantness. They also exhibit an impairment of emotion recognition. These deficits are correlated with cognitive impairments (review in Tremeau, 2006). Second, previous studies do not make sure that events recalled by patients actually occurred, nor do they allow for an evaluation of the frequency of false autobiographical memories, i.e., memories of personal events that never occurred or that have become distorted. This issue is critical in that false memories constitute a fictional aspect of the autobiographical self (Schacter et al., 1998), which may be related to abnormalities of personal identity and the emergence of false beliefs and delusions (Gilbert, 1991). The few studies of false memory that have been conducted in schizophrenia used episodic memory tasks and their results are conflicting. One study indicates that patients with schizophrenia produce less false memories than control subjects (Huron and Danion, 2002), one shows more false alarms in patients (Stirling et al., 1997), whereas others show no differences between patients and controls (Brebion et al., 1997; Elvevag et al., 2004; Moritz et al., 2004, 2006).

Taking into account these limitations, the present study aimed to evaluate the frequency of true and false autobiographical memories and the associated states of conscious awareness in patients with schizophrenia. It also set out to explore the affective and cognitive processes underlying impairment of conscious awareness associated with autobiographical memories. The Remember/Know procedure was used in combination with a diary study methodology (Conway et al., 1996; Pernot-Marino et al., 2004, Blairy et al., 2008), which makes it possible to check the veracity of autobiographical events and to assess

affective and cognitive variables known to play a critical role in the construction of autobiographical memories. Typically, small numbers of participants keep diaries of everyday events, which they judge memorable, for periods of weeks or months. In a recognition test taken several weeks or months later, participants are asked to discriminate between true and false diary entries and judge their state of memory awareness as conscious recollection or feeling of familiarity. Participants are also asked to rate each event both at encoding and at retrieval with scales to assess emotional and memory variables. Using this method, it has been shown that the emergence of conscious recollection in normal people is strongly influenced by the emotional intensity of the event itself, determined by the personal importance attributed to the event by the participant concerned (Conway et al., 1996; Pernot-Marino et al., 2004). On the basis of the afore mentioned studies of conscious recollection and autobiographical memory in schizophrenia, the frequency of true memories associated with conscious recollection was expected to be lower in patients than in controls, and the frequency of simply knowing higher. No specific prediction was made concerning the frequency of false memories.

2. Methods

2.1. Subjects

Eight outpatients (five men, three women) participated in the study (Table 1). They were recruited from the Psychiatry Department of the University Hospitals in Strasbourg (France). They fulfilled the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) criteria for schizophrenia (paranoid, $n=3$; residual, $n=5$), as determined by the consensus of the current treating psychiatrist and two senior psychiatrists in the research team. All of them were clinically stabilized. Patients who were being treated with benzodiazepines, antidepressants, or lithium were excluded. Four patients were receiving typical neuroleptics (mean dose, 120 mg (S.D.=41 mg) of chlorpromazine or equivalent) and three patients were receiving atypical neuroleptics (2 olanzapine and 1 clozapine). One patient was untreated.

The comparison group consisted of eight control participants (four men, four women). They did not suffer from any mental disorders, as established on the basis of a psychiatric examination. The patients and control participants had no history of traumatic brain injury, epilepsy, alcohol or substance abuse, or other neurological problems.

After a complete description of the study had been provided to the participants, their written informed consent was obtained. The study was approved by the Faculty Ethics Committee.

2.2. Procedure

The protocol was adapted from Pernot-Marino et al. (2004). The diary-recording period extended over 1 month. Recognition tests took place 2 months after completion of the last diary entry. There were two sessions of recognition tests, with 1 day in between.

2.2.1. Diary records

Every day each participant made four diary entries: two true events, one altered event, and one false event. All entries were about one paragraph long and consisted of four to seven sentences. Events for recording were selected on the basis that they were memorable in the context of that particular day's set of experiences. Participants generally tended to write a description of the first appropriate event that came to mind.

Table 1
Demographic and clinical characteristics of patients with schizophrenia and comparison subjects.

Characteristics	Patients with schizophrenia		Comparison subjects		t-test	
	M	S.D.	M	S.D.	t	P
Age	39	9.5	40.6	7.5	0.38	0.71
Education	12.6	3.5	12.8	3.4	0.07	0.94
WAIS-R (IQ)	89.2	8.2	101.8	14.1	2.13	0.056
Duration of illness	15.8	9.8	–	–	–	–
Mean age at onset of symptoms	23.3	8.3	–	–	–	–
PANSS						
Positive scale	12.8	5.5	–	–	–	–
Negative scale	17.3	8.7	–	–	–	–
General psychopathology scale	31.8	13.3	–	–	–	–

Note. Patients with schizophrenia: $n=8$ (three women, five men); Control participants: $n=8$ (four women, four men). t test: $df=14$. IQ=Intelligence Quotient; PANSS=Positive And Negative Syndrome Scale.

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