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# Effects of event-specific memory training on autobiographical memory retrieval and depressive symptoms in schizophrenic patients

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ABSTRACT

*Background and objectives:* This report describes the effects of a specific event group-based training programme on autobiographical memory, self-consciousness of memory retrieval, and depression symptoms in a sample of 24 schizophrenic patients (experimental group).
*Methods:* Twenty-six matched schizophrenic patients who participated in social skills and occupational therapy group sessions constituted the active control group. Participants in the experimental group were trained to complete a diary with specific daily memories, followed by patients' ratings of the associated emotional arousal of those entries. During training, significant specific events from childhood, adolescence, adulthood and the previous year were also reviewed.
*Results:* After 10 weeks of group-based sessions, the experimental group demonstrated an increase in their degree of specificity for autobiographical retrievals, had a higher level of consciousness of their memories and showed a decrease in their depression scores. Significant changes in measurements of retrieval specificity and autonoetic awareness were maintained when changes in emotional symptomatology were statistically controlled.
*Limitations:* The present study did not assess the impact of autobiographical memory training on the positive and negative symptoms of schizophrenia.
*Conclusions:* These results suggest that cognitive training strategies based on event-specific autobiographical memory training should be considered for inclusion in intervention programs for schizophrenic patients.



## 1. Introduction

Schizophrenia is a syndrome characterised by several cognitive dysfunctions, one of the most important of which is memory impairment (Aleman, Hijman, de Haan, & de Kahn, 1999; Rametti et al., 2009). Memory of personal events and facts (Weiss & Heckers, 2001), verbal episodic memory (Heinrichs & Zakzanis, 1998) and memory-for-context (Wang, Metzak, Honer, & Woodward, 2010) are affected in schizophrenic patients. Patients with schizophrenia are less confident in their correct responses (Moritz & Woodward, 2007), produce premature termination of data collection (jumping to conclusions) (Moritz, Woodward, & Rodriguez-Raecke, 2006) and have deficits in source monitoring (Brébion, Gorman, Malaspina, & Amador, 2005).This syndrome is accompanied by disturbances in the specificity of autobiographical memories (D'Argembeau, Raffard, & Van der Linden, 2008; Danion et al., 2005; Neumann, Blairy, Lecompte, & Philippot, 2007; Riutort, Cuervo, Danion, Peretti, & Salamé, 2003; Wood, Brewin, & McLeod, 2006). Autobiographical memory is more closely associated with social performance than with psychopathological symptoms in patients with schizophrenia (Mehl, Rief, Mink, Lüllmann, & Lincoln, 2010). Furthermore, people with schizophrenia are less able to produce specific autobiographical memories of events that have occurred since the onset of clinical symptoms (Feinstein, Goldberg, Nowlin, & Weinberg, 1998; Riutort et al., 2003; Wood et al., 2006). These effects have been related to encoding or acquisitions problems. Indeed, slower processing speed impedes the encoding of information rather than the maintenance of information in memory (Brébion, Amador, Smith, & Gorman, 1998). Although individuals with schizophrenia have difficulty organising words semantically to facilitate encoding and retrieval (Cairo, Woodward, & Ngan, 2006), their semantic processing is sufficient to benefit from organisational cues (Ragland et al., 2003). For this reason, memory remediation efforts may be most successful when focused on teaching schizophrenic patients to form organisational strategies during initial encoding (Ragland et al., 2003).

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The lack of memory retrieval specificity in schizophrenic patients has also been related to deficits in autonoetic awareness (Blairy et al., 2008; Huron & Danion, 2002; Neumann et al., 2007). Autonoetic consciousness is the awareness that is experienced when personal events are consciously recalled through a process of mentally reliving them (Wheeler, Stuss, & Tulving, 1997). The association between specific autobiographical memory and autonoetic awareness has been empirically tested (Danion et al., 2005; Neumann et al., 2007). The lack of specificity in the recollection of autobiographical memories and the deficits in autonoetic awareness may be related to the disturbed sense of self that is common in schizophrenic patients (Blairy et al., 2008; Danion, Rizzo, & Bruant, 1999; Huron & Danion, 2002; Riutort et al., 2003). Thus, because recognition and conscious awareness might be severely disrupted in schizophrenia, a past event cannot be used flexibly for guiding and controlling behaviours, affective states, and beliefs (Green, 1996).

The link between autobiographical memory and self-identity has also been investigated using self-defining memories (Singer, 2005; Singer & Moffitt, 1991). Self-defining memories (SDMs) represent exemplar memories of experiences that individuals draw on to inform their sense of identity (Raffard et al., 2009a). In schizophrenic patients, impairments in extracting meaning from personal memories could represent a core disturbance of autobiographical memory (Raffard et al., 2009b). It has been suggested that an inability to derive meaning from self-defining memories has serious consequences in schizophrenic patients, both in terms of their sense of personal identity and in terms of their social adaptation (Raffard et al., 2009a).

Conway and Pleydell-Pearce (2000) have advanced a model of autobiographical memory that unites autobiographical memories, conscious awareness and the autobiographical self. The model postulates that autobiographical memories are transitory mental constructions that are generated from an autobiographical knowledge base where knowledge is held at different levels of specificity. The most specific level (sensory-perceptual details of a particular event) is accompanied by the subjective experience of conscious recollection. In contrast, the subjective experience of simply knowing that a personal event has occurred arises when more generic, abstract knowledge is accessed in the autobiographical knowledge base. The subjective experience of simply knowing is the mere awareness of self-related knowledge, which is not available to the senses (see also Conway, 2005). The relationship between impaired specific autobiographical memory and autonoetic awareness suggests that memory functions can be partly remedied when patients are forced to involve the self at the encoding stage of memory processing and that this intervention is effective as a means of enhancing conscious awareness (Danion et al., 2005; Green, 1996; Stone, Gabrieli, Stebbins, & Sullivan, 1998).

Concerning emotional outcome, previous memory training in patients with schizophrenia did not produce changes in the Beck Depression Inventory (BDI) scores (Blairy et al., 2008). However, metacognitive training has reduced the intensity and distress related with the positive symptoms of schizophrenia (e.g., Agothor, Pfueller, Moritz, Weisbrod, & Roesch-Ely, 2010). Cognitive Behavioral Therapy (CBT) has shown positive effects on anxiety and depression (Penadés et al., 2006). It is currently well established that the presence of depressive symptomatology is common among schizophrenic patients (Bottlender, Strauss, & Moller, 2000; Lancon, Auquier, Reine, Bernard, & Addington, 2001; Markou, 1996; Serretti, Mandelli, Lattuada, & Smeraldi, 2004; Shepherd, Watt, Falloon, & Smeeton, 1989; Siris, 1994, 1995; Wassink, Flaum, Nopoulos, & Andreasen, 1999; see for a review, Hausmann & Fleischhacker, 2002), regardless of their negative symptomatology (Kibel, Laffont, & Liddle, 1993; Kuck, Zisook, Moranville, Heaton, & Braff, 1992; Newcomer, Faustman, Yeh, & Csernansky, 1990). There have been many studies showing that depressive symptoms are regular features of schizophrenia (Baynes et al., 2000; Birchwood, Iqbal, Chadwick, & Trower, 2000; Johnson, 1981; Knights & Hirsch, 1981; Koreen et al., 1993; Möller & Von Zerssen, 1982; Nakaya, Ohmori, Komahashi, & Suwa, 1997; Xiang, Weng, Leung, Tang, & Ungvari, 2007; Zisook et al., 1999). The most commonly used depression rating scales employed by psychiatrists for assessing schizophrenia are the Hamilton Depression Rating Scale (HDRS) and the Beck Depression Inventory (BDI) (Addington et al., 2002). The use of BDI has been generalised in the empirical research of depression and schizophrenia (e.g., Barnes, Curson, Liddle, & Patel, 1989; Baynes et al., 2000; Chemerinski, Bowie, Anderson, & Harvey, 2008; Heald, Morris, & Soni, 2008; Johnson, 1981, 1988; Kim et al., 2010; Moore, Cassidy, Carr, & O'Callaghan, 1999; Schwartz-Stav, Apter, & Zalsman, 2006). Most specifically, depression scores, but not negative symptoms, are associated with a decrease in cognitive speed in schizophrenic patients (Brébion, David, Jones, & Pilowsky, 2009). In fact, when depression was controlled for, processing speed was not significantly correlated with either positive or negative symptomatology (Brébion et al., 2005).

A growing body of literature has demonstrated the effects of specific memory training on different neuropsychological variables. Blairy et al. (2008) trained schizophrenic patients to repeatedly recall daily events. Exercises about personal future goals and discussions of personal identity, self-definition, roles in life and projections on the future were also part of the group therapy sessions. This intervention improved the ability to recall specific events, which was preserved 3 months later. However, no neuropsychological (e.g., working memory) or affective benefits of these exercises were found. More recent therapies (e.g., Cognitive Remediation Therapy) with schizophrenic patients encourage the improvement of executive functions to improve daily functioning (Penadés Catalán, Puig et al., 2010). Similar intervention strategies for patients with emotional disorders have been studied. Serrano, Latorre, Gatz, and Montañés (2004) found fewer depressive symptoms in older adults with depressive symptomatology after they engaged in a "life review therapy" (LRT) based on autobiographical retrieval. The life review consisted of an autobiographical retrieval practice that entailed focusing on a particular life period each week (childhood, adolescence, adulthood, and summary). For each period, 14 questions were prepared based on theories of reminiscence (Haight & Webster, 1995). The questions were focused on positive events (e.g., "What was the most pleasant situation that you remember from your childhood?" or "Tell me about a day when you were an adolescent and you did something out of the ordinary."). The effects of specific memory training on the awareness of retrieval were not reported in these studies. The present study aimed to analyse the effects of a group-based, 10-week-long, memory-based cognitive therapy regimen on the specificity of memory retrieval, the symptoms of depression and the degree of retrieval awareness of patients with schizophrenia. Importantly, the measurement of this last domain is a novel contribution of this study. Participants were trained to complete detailed diaries throughout the entire intervention program in accordance with the procedure of Blairy et al. (2008). These memories captured events from the past week. In a second phase, when participants were familiar with this task, they were trained to recover significant personal past events or self-defining memories from childhood, adolescence, adulthood and the previous year. This second phase applied the method and structure of the LRT (Serrano et al., 2004) in a group setting.

We expected an improvement in memory specificity for the memory training group, as has been reported previously (Blairy et al., 2008). Due to the relationship between memory specificity