Self-defining memories related to illness and their integration into the self in patients with schizophrenia

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ABSTRACT

Although schizophrenia alters the sense of personal identity, little is known about the impact of illness-related autobiographical events on patients’ self-representation. We investigated self-defining memories (SDM) in 24 patients with schizophrenia and 24 controls to explore how illness-related SDM were integrated into the self at both the cognitive (how participants are able to give a meaning to past events: meaning making) and affective levels (how participants can re-experience past negative events as less negative: redemption and benefaction effects). We found that 26% of freely recalled SDM referred to their illness in patients. Further, while meaning making was impaired in patients for both illness-related and other SDM, illness-related SDM were characterized by a higher redemption and benefaction effects than other SDM. Our results highlight that despite a reduced ability to give a meaning to illness-related episodes, emotional processing seems to allow these events to become positively integrated into patients’ life stories. This study provides new findings about the construction of the self in relation to psychotic episodes in patients with schizophrenia. We discuss clinical implications of our results that are helpful to guide cognitive interventions.

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1. Introduction

Patients with schizophrenia suffer from serious identity disorders, which despite long-standing clinical descriptions (Bleuler, 1911; Freedman, 1974; Minkowski, 2002) remain poorly understood. Given that the self is intimately linked to past personal experiences (Beike et al., 2004; Conway, 2005), studying autobiographical memory provides useful and relevant tools for addressing the question of disorders related to the self. Several autobiographical memory studies conducted with patients with schizophrenia have shown deficits in general memories of other past experiences but also in memories which play a critical role in the construction of one’s personal identity. However, little is known about the impact of memories related to the illness in patients with schizophrenia and more specifically about how they are integrated or not into patients’ representation of themselves. Psychotic episodes strongly alter both how reality is experienced and one’s subjective sense of self; they are often experienced as traumatic by patients due to not only the psychotic symptoms themselves but also the events related to the hospitalization (Shaw et al., 1997; Meyer et al., 1999; Harrison and Fowler, 2004).

Literature on post-traumatic stress disorder (PTSD) offers two contradictory hypotheses regarding the integration of traumatic memories into individuals’ biography. The first considers that because traumatic experiences contradict prior schematized knowledge of the self they cannot be well integrated into the person’s overall life story (Brewin et al., 1996; Nijenhuis and van der Hart, 1999). According to this view, traumatic memories are disconnected from other stored autobiographical experiences and emerge as intrusions. An alternative view posits that traumatic experiences in patients suffering from PTSD stand out as landmarks in the autobiographical knowledge base around which other life events are linked (Berntsen, 2001). These memories do not themselves contain traumatic information but are regarded as being thematically or causally related to the traumatic event. Further, PTSD patients often strive to attribute a meaning to traumatic experiences (Geninet and Marchand, 2007), considering them to be part of their current identity (Berntsen et al., 2003) and supporting current personal goals (Sutherland and Bryant, 2005). This argues in favor of a high, albeit dysfunctional integration of traumatic memories into individuals’ identity (Berntsen et al., 2003). Reasoning that psychotic experiences represent highly stressful situations in individuals’ lives leading them to reconsider their own self, life and other persons, sometimes in a completely different way (Chadwick,
might conclude the painful narrative of his brother's death by and who they have become. A similar process can be addressed at an the world. Accordingly, individuals are held to have integrated a past dif meaning making to describe the ability to assign a meaning to self-
depression (Lysaker and Buck, 2007). Attention has been given to chronic psychiatric illnesses like schizo-
related self-de-identity (Wilson, 2007). Williams (2000) also highlighted the impor-
tance of narratives referring to the illness for a better understanding of the relationship between identity and illness. In particular he demonstrated how illness could become part of one's personal biography, with life-events interpreted as factors that may have caused the illness. According to Brown and Harris (1989), this requires context-
specific processes of meaning endowment and emotional processes to be well integrated. It is worth noting here that these theoretical developments have all focused on chronic physical illness. Scant attention has been given to chronic psychiatric illnesses like schizo-
psychrophrenia (Lysaker and Buck, 2007).

Focusing on autobiographical memories related to illness in schizophrenia would be of great importance for gaining a better understanding of patients' self-representation and how it is affected by the illness. One way of addressing this issue is to study illness-related self-defining memories (SDM) in patients. Such memories are defined as memories referring to highly significant events, which provide people with a better understanding of both themselves and others or the world (Singer and Moffitt, 1991). Two complementary methods have been proposed for assessing the integration of significant past experiences into the self from cognitive and affective perspectives. Blagov and Singer (2004) proposed the concept of meaning making to describe the ability to assign a meaning to self-
defining memories. They postulated that this process allows individ-
uals to stand back from a past event and to realize how this event has changed their personality or the way they see themselves, others or the world. Accordingly, individuals are held to have integrated a past personal event once they are able to make a link between this event and who they have become. A similar process can be addressed at an emotional level. This approach was developed by McAdams (2001), based on the observation that individuals who have experienced difficult life events tend to end their narration of these events with a positive evaluation (“redemption effect”). For example, a person might conclude the painful narrative of his brother’s death by explaining how this event has led him to take more care of his relationships with close friends and how it has improved the quality of his bonds of friendship. In line with this, Wood and Conway (2006) proposed to measure the way in which individuals tend to lower the significance of past signi-
ficant events and found that individuals who generate more redemptive themes in their memories are less prone to depression, and have higher levels of subjective well-being, and better physical and mental health generally.

This study is part of a more general investigation of memory in schizophrenia, in which participants were asked to retrieve their self-
defining memories freely (see Berna et al., in press). In this part, we focused on self-defining memories related to the illness by asking patients to recall such memories specifically. Our aim was to study how patients integrated these memories into the self. To this end, we assessed meaning making as well as the redemption, benefaction effects and symptoms of PTSD associated with self-defining memories related to the illness. We postulated that the ability to attribute a meaning to self-defining memories is impaired in patients with schizophrenia, as we found in the first part of the study and as was shown by Raffard et al. (2009, 2010). Further, we thought the affective processing of personal memories that are involved in both the redemption and benefaction effects might be challenged by the dysregulation of emotional processes largely described in schizophrenia (Myin-Germeys et al., 2001). Our assumption was that in patients a greater impairment of meaning making, or lower proportion of redemptive events in illness-related memories than other memories would suggest these former memories are less integrated into the self. Alternatively, evidence of benefaction and redemption effects would indicate that despite poor meaning making, these illness-related memories that became an integral part of the self were nevertheless positively integrated.

2. Method

2.1. Participants

Twenty-four outpatients (12 women) took part in the study. They were recruited from the Psychiatry Department of the University in Strasbourg. Patients all fulfilled the DSM-IV-TR criteria (APA, 2000) for schizophrenia (paranoid, n = 21; residual, n = 2; undifferentiated, n = 1) as determined by consensus of the current treating psychiatrist and two senior psychiatrists in the research team. All of the patients were clinically stabilized, i.e. they had not been hospitalized and their usual treatment had not been modified for a period of one month preceding the test; patients were aware of their diagnostic. Patients with a history of traumatic brain injury, epilepsy, alcohol and substance abuse (according to DSM-IV-TR criteria), or other neurological conditions were excluded from the study, as were those diagnosed as currently suffering from major depressive disorder, as defined by a score superior to 4 according to the Calgary Depression Scale for Schizophrenia (Addington et al., 1993), and patients with an IQ of less than 70, as assessed using a short form of the Wechsler Adult Intelligence Scale Revised (Crawford et al., 1996). All but one of the patients were taking long-term neuroleptic treatment (atypical, n = 18; typical, n = 4 and both typical and atypical, n = 1). Two were being treated with benzodiazepines, seven with antiparkinsonian treatment and none with mood stabilizer. The comparison group comprised 24 control participants (12 women) with no history of psychiatric, neurologic disorders or substance abuse. Control participants were recruited via newspaper advertisements. There was no difference between patients and controls in terms of age, level of education, premorbid IQ (F-NART; Mackinnon and Mulligan, 2005), current IQ (Crawford et al., 1996) and self-esteem (Rosenberg, 1965; Vallières and Vallerand, 1990). Characteristics of patients and controls are presented in Table 1. This research study was completed in accordance with the Helsinki Declaration; it was approved by the local ethics committee and all participants gave their informed written consent.

2.2. Materials

2.2.1. Self-defining memories questionnaire

An adaptation of the procedure initially proposed by Singer and Moffitt (1991) was used. Participants were asked to search for 5 self-defining memories, defined as: (a) a memory that is at least one year old; (b) a memory from your life that you remember very clearly and that still feels important to you even when you think about it; (c) a memory that helps you understand who you are as an individual and which might be a
memory you would share with someone else if you wanted that person to understand you in a basic way; (d) a memory that may be positive or negative, or both, in terms of how it makes you feel now. The only important aspect is that it triggers strong feelings; and (e) a memory you have thought about many times. It should be familiar to you like a picture you have studied or a song you have learnt by heart.

2.2.2. Positive And Negative Affective States (PANAS, Watson et al., 1988; Gaudreau et al., 2006)

This adjectival checklist comprises two 10-item subscales of positive (active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong) and negative (afraid, ashamed, distressed, guilty, hostile, irritated, jittery, nervous, scared, and upset) affects, the intensity of which is rated by participants on a score ranging from 1 to 5.

2.2.3. The impact of events scale — revised (Brunet et al., 2003)

This scale comprises 22 items on 5-point scales (from 0 to 4) assessing symptoms of post-traumatic stress disorder associated with memories. Memories associated with a score higher than 24 were defined as traumatic memories (Anshak, et al., 2002).

2.2.4. Subjective impact and personal significance scales (Wood and Conway, 2006)

Subjective impact and general, non-specific aspects of personal significance of each memory were assessed using 7 items on 7-point scales (see, Appendix A). These scales were used to ensure that the retrieved memory met the criteria of a genuine self-defining memory, as described by the self-defining memory questionnaire.

2.3. Procedure

The procedure consisted of two sessions. In the first session, clinical (CDSS, RSE and for patients: PANSS; Kay et al., 1987) and psychometric assessments (WAIS-R, f-NART) were carried out. Participants were then asked to find five self-defining memories (SDM) according to the aforementioned definition (Singer and Moffitt, 1991). As it was important that they had sufficient time for introspection and to select the memories that best fitted the criteria, they were given one week to find the five memories, after first being given a sheet of paper which explained the self-defining memory criteria and instructed them to write both the title and details of each memory (where people were, whom they were with, what happened, and how they and the other people present responded to the event). We reasoned that in the case of patients, poor introspection capacity would lead them to select memories that are highly accessible but not especially highly significant for the self. The second session took place 7±2 days after the first one. At the beginning of this second session, participants narrated each memory out loud. All the memories they recounted were recorded and then transcribed for analysis. After their narrative, participants were asked to rate the PANAS assessing the intensity of the emotions they had felt at the time of the event (recalled emotions) and their current emotions when remembering respectively (see, Wood and Conway, 2006) and completed the IES-R (Brunet et al., 2003). After telling their five memories, patients were asked to answer the following question: “Is this memory related in any way to your psychological illness?” They were given no specific criteria regarding the kind of relationship this might be. Patients were free to categorize SDM as being related to their illness irrespective of the link. Control participants were asked a similar question: “Is this memory related in any way to an illness you have had?” For each memory, “a benefit effect” score was calculated by adding up the absolute values for the increase in positive emotions and reduction in negative emotions between the time the event occurred and the time of remembering (see, Wood and Conway, 2006). The benefit effect score was subjected to an ANOVA using group and category as predictor variables. A binomial logistic regression using the same group and category factors was used to analyze the self-report data. The analysis was performed only on events with a negative valence.

2.4. Scoring

2.4.1. Spontaneous meaning making (SMM)

Each memory was coded for the absence (0) or presence (1) of meaning making, using the criteria proposed by Singer and Blagov (2000). Meaning making was considered to be present when participants took a step back from narrative events and descriptions to make an additional statement about the significance or meaning of the memory (e.g., “during this period when my parents divorced I realized I had left the world of my childhood and had become mentally stronger but also harsher on others”).

2.4.2. Cued meaning making (CMM)

The same procedure as for SMM was used to code the absence (0) or presence (1) of cued meaning making in explanations given by participants to the last question mentioned above: “To what extent was this event important for you and how does it help you to describe who you are?”

2.5. Statistical analysis

We used a multilevel statistical analysis, which is particularly relevant for autobiographical memory studies because it allows memories to be treated as the statistical unit while taking into account the intra-subject variance and the fact that memories are not independent in one individual (Wright, 1998). This method was also more appropriate for our study because the number of memories was small and differed between categories of memories (5 vs. 3). The multilevel model assigned memories to level 1 and participants to level 2, and the analyses were performed using the MLWin software, version 2.10. Whenever significant interactions were observed, post-hoc analyses were performed separately in each group.

2.5.1. Personal significance and meaning making

The global personal significance scores were subjected to an analysis of variance (ANOVA) with group (patients vs. controls) and category of memories (illness vs. other) as predictor variables. Meaning making was treated as a binary response and subjected to a two-level logistic regression for repeated measures using 3 predicting factors: cueing (spontaneous vs. cued), group, and category.

2.5.2. Redemption, emotions and traumatic memories

The emotional scores from the PANAS were subjected to an ANOVA for repeated measures, with group, category and time (recalled vs. current) as predictor variables. For each memory, a “benefit effect” score was calculated by adding up the absolute values for the increase in positive emotions and reduction in negative emotions between the time the event occurred and the time of remembering (see, Wood and Conway, 2006). The benefit effect score was subjected to an ANOVA using group and category as predictor variables. A binomial logistic regression using the same group and category factors was used to analyze the emotional valence of the events, redemption and traumatic memories (IES-score < 24). According with the definition of redemption, the analysis was performed only on events with a negative valence.

To take account of the fact that participants had one week to find the first SDM but then had to find the other 3 during the second session, we first performed the same analyses but at the same time incorporated a supplementary order factor (first vs. subsequently given SDM). Since there was no difference between the results with and without this additional factor, and since no interaction was found between the order factor and other factors, the results are presented here without the order factor.

3. Results

Considering the first 5 SDM given, 16 out of 24 patients (66.7%) mentioned at least one SDM as being related to their illness. Further, 26.6% of the patients’ memories (1.33/5) were categorized as related to their illness. In control participants, 9.2% of their memories (0.46/5) referred to illnesses of people close to them but none to a personal

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Control participants (n = 24)</th>
<th>Patients (n = 24)</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>36.2 (5.8)</td>
<td>35.3 (6.9)</td>
<td>0.42</td>
</tr>
<tr>
<td>Education (years)</td>
<td>11.8 (2.0)</td>
<td>11.5 (2.2)</td>
<td>0.34</td>
</tr>
<tr>
<td>RSE</td>
<td>33.1 (4.6)</td>
<td>32.0 (4.0)</td>
<td>0.91</td>
</tr>
<tr>
<td>WAIS-R (current IQ)</td>
<td>92.5 (10.5)</td>
<td>89.8 (13.3)</td>
<td>0.77</td>
</tr>
<tr>
<td>f-NART (premorbid IQ)</td>
<td>106.8 (6.6)</td>
<td>104.2 (7.3)</td>
<td>1.31</td>
</tr>
<tr>
<td>Duration of illness (years)</td>
<td>-</td>
<td>11.4 (5.0)</td>
<td>0.77</td>
</tr>
<tr>
<td>Age at onset of the illness</td>
<td>-</td>
<td>24.0 (7.0)</td>
<td>0.77</td>
</tr>
<tr>
<td><strong>PANSS total score</strong></td>
<td>61.4 (17.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PANSS positive score</strong></td>
<td>15.1 (5.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PANSS negative score</strong></td>
<td>15.1 (7.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PANSS general score</strong></td>
<td>31.2 (9.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values given as mean (standard deviation). RSE, Rosenberg-Self-Esteem; WAIS-R, Wechsler Adult Intelligence Scale — Revised; f-NART, French National Adult Reading Test; PANSS, Positive and Negative Symptoms Scale.
illness. Regarding patients' memories related to their illness, 83.9\% (2.52/3) referred to a psychotic episode (1.36/3 taking place in a psychiatric hospital), and 16.1\% (0.48/3) referred to other past events that patients considered to have contributed to their illness.

Considering all the SDM given, 3 patients categorized more than 3 of the first SDM given as being related to their illness, whereas 3 controls gave less than 3 illness-related SDM. In patients, three memories were not related to their psychological illness despite cuing, and these memories were excluded from the analysis. A total of 377 memories were obtained (out of 384 expected memories) and used for statistical analysis. Qualitative analysis of the illness-related memories revealed that 71.0\% of the patients' memories (2.13/3) referred to a personal illness and 84.4\% (2.53/3) referred to a personal illness and 84.4\% (2.53/3) to the illness of a close relative.

3.1. Personal significance and meaning making

Personal significance did not differ between groups or category of events and no interaction was found. Patients had lower meaning making than controls (P<0.001) and cued meaning making was higher than spontaneous meaning making (P<0.001) in both groups. No significant difference was found between categories of SDM but a significant interaction between group and category of memories (P=0.006); in controls, meaning making was significantly lower in illness-related SDM than other SDM (P=0.02), whereas no significant difference was observed in patients (P=0.05). No other interaction was found (see Table 2).

3.2. Redemption, emotions and traumatic memories

Emotional scores (PANAS) were lower in current emotions than in recalled emotions (P<0.001), and higher in other SDM than in illness-related SDM (P=0.003). A significant interaction between group and time (P=0.004) showed that the reduction of emotional intensity between recalled and current emotions was weaker in patients than control participants. The significant interaction between group and category (P<0.001) was explained by a lower emotional intensity in illness-related SDM than in other SDM in controls (P<0.001), whereas no significant difference was found in patients (P=0.05). No other effect or interaction was found.

A significant interaction between group and category (P=0.04) was found for the benefitation effect score: this was explained by significantly higher scores in illness-related SDM than in other SDM in patients (P=0.02), whereas no significant difference was found in controls (P=0.05). Regarding the valence of the events, illness-related SDM were more negative than other SDM (P<0.001). A significant interaction between group and category (P=0.04) was found for redemption: in patients the proportion of redemptive events was higher in illness-related SDM than other SDM, whereas it was lower in control participants, but these differences were not significant (all Ps>0.05). Finally, patients displayed more traumatic memories than controls (P=0.04). No other effect or interaction was found for the benefitation effect, redemption, valence or traumatic memories.

We performed secondary analyses after splitting the group of patients into two subgroups, one with good insight (PANSS-G12=1–2; n = 15), the other with impaired insight (PANSS-G12 item 2–n = 9; the median score of G12 item was 2). Given the small number of subjects in each subgroup, we performed Mann–Whitney U-tests. We found no difference between patients with good vs. impaired insight with respect to the proportion of events associated with redemption (M = 0.19, S.D. = 0.17, S.D. = 0.19, respectively; U = 58, P = 0.59), the mean benefitation effect score (M = 0.49, S.D. = 0.73 and M = 0.29, S.D. = 0.31, respectively; U = 51.5, P = 0.36) and the proportion of events associated with SMM (M = 0.19, S.D. = 0.20 and M = 0.14, S.D. = 0.16, respectively; U = 61.5, P = 0.74) and CMM (M = 0.52, S.D. = 0.24 and M = 0.53, S.D. = 0.30, respectively; U = 64, P = 0.86). Finally, age of memories related to illness was significantly higher than other SDM (P<0.01). No effect of group and no interaction were found (see Table 2).

4. Discussion

Our results show that more than two thirds of the patients spontaneously mentioned at least one of the five self-defining memories

### Table 2

Cognitive and emotional characteristics of self-defining memories (SDM) related or not to the illness.

<table>
<thead>
<tr>
<th></th>
<th>Control participants (n=24)</th>
<th>Patients with schizophrenia (n=24)</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Illness-related SDM</td>
<td>Other SDM</td>
<td></td>
</tr>
<tr>
<td>Age at the time of the events</td>
<td>23.1 (9.3)</td>
<td>20.5 (5.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>25.6 (6.9)</td>
<td>21.5 (7.1)</td>
<td></td>
</tr>
<tr>
<td>Cognitive characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous meaning making</td>
<td>37.0 (33.3)</td>
<td>48.8 (27.6)</td>
<td>Group n.s.</td>
</tr>
<tr>
<td>Cued meaning making</td>
<td>61.6 (33.9)</td>
<td>81.3 (20.6)</td>
<td>Category n.s.</td>
</tr>
<tr>
<td>Emotional characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANAS score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recalled emotions</td>
<td>39.1 (10.7)</td>
<td>47.5 (9.6)</td>
<td>Group n.s.</td>
</tr>
<tr>
<td>Current emotions</td>
<td>29.8 (9.4)</td>
<td>34.6 (7.7)</td>
<td>Category n.s.</td>
</tr>
<tr>
<td>Memories with negative valence</td>
<td>92.8 (14.1)</td>
<td>57.9 (29.0)</td>
<td>Group n.s.</td>
</tr>
<tr>
<td>Benefaction effect</td>
<td>0.73 (12.3)</td>
<td>4.23 (8.17)</td>
<td>Group n.s.</td>
</tr>
<tr>
<td>Redemption</td>
<td>13.8 (17.9)</td>
<td>31.8 (33.1)</td>
<td>Group n.s.</td>
</tr>
<tr>
<td>Traumatic events</td>
<td>4.4 (11.5)</td>
<td>11.1 (15.7)</td>
<td>Group n.s.</td>
</tr>
</tbody>
</table>

*P<0.05; **P<0.01; ***P<0.001.

(SDM) as being related to their psychological illness. According to the definition of SDM (Singer and Blagov, 2000), patients experienced these events as being significant both for self-understanding and for explaining to other people who they really are. This suggests that some illness-related SDM are part of patients' representation of themselves (Blagov and Singer, 2004). However, these events referred mostly to highly emotional experiences of psychotic episodes and/or hospitalization, which raises the question of whether memories of such events could really be integrated in patients' personal identity (Berntsen et al., 2003; Sutherland and Bryant, 2005). Our study addressed this issue at both cognitive and emotional levels.

At the cognitive level, we first found that the ability to attribute a meaning to SDM was globally impaired in patients with schizophrenia. These results confirmed those obtained in the first part of our study and those of Raffard et al. (2009, 2010). Secondly, patients' ability to give a meaning to past events was similar in both categories of events. This remained true even when participants were explicitly asked to give a meaning to their SDM. On the other hand, control participants displayed lower meaning making for illness-related SDM than other SDM. It is worth noting that personal significance scores did not differ between categories of SDM or between groups. This suggests the explanation for our results could not lie with differences regarding the significance of the selected memories or with the way the task instructions were understood. The ability to assign a meaning to past experiences was shown to be a critical mechanism for allowing personally significant events to be integrated into the self (Blagov and Singer, 2004). Our results confirm that this ability was also reduced for illness-related SDM in patients, but also show that this reduction was not more pronounced than that observed with other SDM. At the emotional level, while both categories of SDM had a similar emotional intensity in patients and controls, the benefaction effect score was significantly higher in illness-related SDM than in other SDM in patients but not in controls. These results of subjective ratings were in keeping with redemption ratings showing more redemptive events in illness-related SDM than other SDM in patients contrary to controls. However, the differences failed to reach significance when performed in each group separately. According to McAdams (2001), the ability to transform the emotional charge of an event by lowering its negative component while increasing its positive component is crucial for preserving self-esteem as well as a sense of life coherence. Taken together, our results suggest that, despite their reduced meaning making ability, patients were still able to stand back from their highly emotional illness-related memories and to experience more positive emotions at the time of remembering. The reduced ability to give sense to illness-related SDM does not seem to prevent these memories to be positively integrated into the self.

Patients had more traumatic SDM than controls. Our results are in keeping with those of Raffard et al. (2009) who showed that patients' SDM referred more frequently to life-threatening events than those of controls. Several studies have also shown that patients with schizophrenia reported a higher incidence of traumatic events (Resnick et al., 2003; Spence et al., 2006) and suffered more frequently from PTSD (Mueser et al., 2002) than the general population. However, about 15.8% of patients' illness-related SDM were accompanied by symptoms of PTSD, which is less than what previous studies had described (Shaw et al., 1997; Meyer et al., 1999). This relatively low frequency of traumatic memories may be explained by the task requirement to select SDM. But it is worth mentioning that traumatic illness-related memories that were not selected may have an influence on self-definition even if forgotten (see also, Fivush, 2004).

To the best of our knowledge this study is the first that has systematically addressed the issue of SDM related to illness in patients with schizophrenia and explored the cognitive and emotional mechanisms related to their integration into the patients' self. The proportion of freely recalled SDM relating to the illness was substantially higher in our study than in the study by Raffard et al. (2010). Unlike Raffard and colleagues, who investigated 3 freely recalled SDM, we investigated 5; this may have led to a higher probability for SDM related to illness to be selected. However, a limitation of this study has to do with our control group, insofar as control participants were not suffering from any psychological or physical illness, and controls' memories mainly referred to illness involving close relatives. Thus, it would be worthwhile conducting a further study involving a control group made up of patients suffering from a chronic physical illness in order to compare the impact of schizophrenia on subjective identity to that of another chronic illness. To make up for this limitation, our interpretation was based mainly on differences observed in the group of patients between illness-related SDM and other SDM and to a lesser extent on group differences. Moreover, it is worth noting that the vast majority of our patients were seen regularly by a psychiatrist. Thus, the effects of the psychotherapeutic process could account for some of our results. It is possible that by inviting patients to speak about past psychotic episodes, and by helping them to distance themselves from these events, the emotional and possibly traumatic impact of events related to psychotic episodes may have been reduced. Lysaker and Buck (2007) advocate that both the significance attached to psychotic episodes, when these events can be replaced in the context of the patients' overall life story, and the information given to patients about their illness, are crucial for helping patients incorporate these events into their personal life narratives. Our results also suggest that even if patients have difficulty making sense of past illness-related experiences, the therapist must not think patients necessarily remember these events as being negative. On the contrary, patients would benefit from having their therapist encourage a positive reappraisal of these past events (Lazarus and Folkman, 1984). Finally, patients' medications might possibly have an impact on autobiographical memory and affective processes, but it is not known whether this impact is negative or positive, due for instance to stabilization of the illness.

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Appendix A

Seven-point scales assessing subjective impact and personal significance (Wood and Conway, 2006).

<table>
<thead>
<tr>
<th>Example</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. This past event has had a big impact on me</td>
<td></td>
</tr>
<tr>
<td>b. I feel I have grown as a person since experiencing this past event</td>
<td></td>
</tr>
<tr>
<td>c. Having had this experience, I have more insight into who I am and what is important to me</td>
<td></td>
</tr>
<tr>
<td>d. Having had this experience, I have learned more about what life is all about</td>
<td></td>
</tr>
<tr>
<td>e. Having had this experience, I have learned more about what other people are like</td>
<td></td>
</tr>
<tr>
<td>f. Even when I think of the event now, I think about how it has affected me</td>
<td></td>
</tr>
<tr>
<td>g. I have often spent time thinking about what this event means to me</td>
<td></td>
</tr>
</tbody>
</table>

Appendix B

Example of illness-related SDM associated with redemption in a patient with schizophrenia.

“I went to Italy with my sister five years ago. I got sick because of my psychotic problems and didn't want to stay in Italy any longer. I didn't want to because I was very sick, I couldn't do anything, I was depressed, deluded. My sister called my father and he said he would come to take me home by coach. So he came because I couldn't stay there any longer. I thought I was not really a bad person”.

We thank Pr. Hédelin for his kind statistical support. Authors declare no conflicts of interest and had no sources of financial support.
References


