Do Patients With Schizophrenia Consciously Recollect Emotional Events Better Than Neutral Events?

Jean-Marie Danion, M.D.
Mathilde Kazes, M.D., Ph.D.
Caroline Huron, M.D., Ph.D.
Nourdine Karchouni, M.D.

Objective: The influence of the emotional valence of words on conscious awareness was assessed in patients with schizophrenia.

Conscious awareness associated with recognition memory comprises two distinct subjective states that may be investigated experimentally with the remember/know procedure (1). In a recognition task, subjects are asked to report their subjective state of awareness at the time that they recognize each individual item. They are instructed to give a “remember” response if they consciously recollect something that they experienced when they learned the item—that is, if they mentally relive the learning episode. They are instructed to give a “know” response if recognition is accompanied by feelings of familiarity in the absence of any conscious recollection. In normal subjects, emotions influence the two states of awareness differentially: “remember” responses but not “know” responses are more frequent for emotional than for neutral events (2).

Use of the remember/know procedure has shown that patients with schizophrenia exhibit lower levels of “remember” but not “know” responses (3). Although disturbances of emotion are a major aspect of schizophrenia (4), studies that have used the procedure have been conducted with neutral stimuli, leaving unexplored the states of awareness that accompany memory for emotional events. We used the remember/know procedure to assess the influence of emotional words on conscious awareness in patients with schizophrenia. Results were analyzed according to the mutually exclusive categories of “remember” and “know” responses and in reference to the model developed by Yonelinas et al. (5), which posits that processes of conscious recollection and familiarity underlying the subjective states of awareness are independent. Because patients with schizophrenia remain sensitive to the emotional salience of words (e.g., reference 6), we predicted that despite lower overall levels, “remember” responses and conscious recollection should be enhanced by emotional words.

Method: The remember/know procedure was used to test 24 patients with schizophrenia and 24 normal comparison subjects.

Results: Patients’ “remember” responses and conscious recollection were more frequent for emotional words than for neutral words. In contrast, the levels of “know” responses and familiarity were independent of emotional words.

Conclusions: Patients with schizophrenia consciously recollected emotional words better than neutral words.

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TABLE 1. Memory Performance as a Function of Emotional Valence of Words in Patients With Schizophrenia and Normal Comparison Subjects

<table>
<thead>
<tr>
<th>Item From the Paradigm</th>
<th>Patients With Schizophrenia (N=24)</th>
<th>Comparison Subjects (N=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (rating=67.5)</td>
<td>Neutral (rating=56.9)</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Studied wordsa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Remember”</td>
<td>0.31</td>
<td>0.16</td>
</tr>
<tr>
<td>“Know”</td>
<td>0.36</td>
<td>0.20</td>
</tr>
<tr>
<td>New words</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Remember”</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>“Know”</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Conscious recollection</td>
<td>0.31</td>
<td>0.16</td>
</tr>
<tr>
<td>Familiarityd</td>
<td>2.00</td>
<td>0.93</td>
</tr>
</tbody>
</table>

a Subjects rated emotional valence of words on a 100-mm visual analogue scale.
b Subjects were asked to give a “remember” response if they consciously recollected something that they experienced when they learned the item and to give a “know” response if recognition was accompanied by familiarity without recollection.
c Conscious recollection (Rec) was an estimate of how often words were correctly recollected relative to the number of opportunities the participants had to do so.
d Familiarity (Fd) was derived from the participants’ tendencies to give a correct “know” response to old words and an incorrect “know” response to new words (5).

Results

Both groups discriminated among positive, negative, and neutral words (F=91.2, df=2, 88, p<0.0001) and did so to the same extent, as indicated by a nonsignificant group effect and a nonsignificant interaction effect between group and word type (Table 1). An ANOVA performed on “remember” responses yielded a significant group effect (F=55.4, df=1, 46, p<0.0001), with patients giving fewer “remember” responses than normal comparison subjects. There was a significant effect for word type (F=29.1, df=2, 92, p<0.0001) but no interaction between word type and group. In both groups, the proportion of “remember” responses was significantly higher for positive than for negative words, with parallel variations in conscious recollection. In contrast, the levels of “know” responses and familiarity were not influenced by the emotional words. Similar profiles were observed in the normal comparison subjects, with the exception of the “know” responses, which showed significant variations: “know” and “remember” responses traded off against one another, probably because of a ceiling effect in overall recognition performance. The assumption that “remember” and “know” responses are exclusive, whereas conscious recollection and familiarity are independent, explains why normal comparison subjects exhibited different profiles of “know” responses and familiarity. The impact of emotional words on conscious recollection may be preserved because the evaluation of the emotional valence of words can occur automatically or with minimal strategic processes (5). Whether this impact is preserved with all types of emotional stimuli remains to be established.

Discussion

Our patients evaluated the emotional valence of words in a manner similar to that of the normal comparison subjects. Under these conditions, the patients, like the comparison subjects, consciously recollected emotional words better than neutral words. Despite lower recollection levels, their “remember” responses were more frequent for emotional than for neutral words and for positive than for negative words, with parallel variations in conscious recollection. In contrast, the levels of “know” responses and familiarity were not influenced by the emotional words. Similar profiles were observed in the normal comparison subjects, with the exception of the “know” responses, which showed significant variations: “know” and “remember” responses traded off against one another, probably because of a ceiling effect in overall recognition performance. The assumption that “remember” and “know” responses are exclusive, whereas conscious recollection and familiarity are independent, explains why normal comparison subjects exhibited different profiles of “know” responses and familiarity.
Emotions are closely related to adaptive behavior at an automated level. But because emotions enhance conscious recollection, they also offer the flexibility of response based on memory for emotional events from the subject’s personal past. Evidence of a preserved effect of emotional stimuli on conscious recollection therefore suggests that patients may still benefit from such flexibility, at least in some situations. Other clinical implications may be more negative. Since emotion is the consequence of how people construe situations, some neutral events or experiences may become emotional by virtue of false beliefs or delusions. Because these events are more easily recalled later and, hence, more richly and vividly experienced in memory, they could contribute to the persistence and/or the enrichment of delusional experiences.

Received July 25, 2002; revision received Feb. 14, 2003; accepted March 6, 2003. From INSERM Unité 405, Département de Psychiatrie, Hôpitaux Universitaires. Address reprint requests to Dr. Danion, INSERM Unité 405, Département de Psychiatrie, Hôpitaux Universitaires, 1 place de l’Hôpital, BP 426, 67091 Strasbourg Cedex, France; danion@alsace.u-strasbg.fr (e-mail).

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8. Andreasen NC: Scale for the Assessment of Negative Symptoms (SANS). Iowa City, University of Iowa, 1983

Brief Report

Are Impairments of Action Monitoring and Executive Control True Dissociative Dysfunctions in Patients With Schizophrenia?

And U. Turken, Ph.D.  
Patrik Vuilleumier, M.D.  
Daniel H. Mathalon, Ph.D., M.D.  
Diane Swick, Ph.D.  
Judith M. Ford, Ph.D.

Objective: Impaired self-monitoring is considered a critical deficit of schizophrenia. The authors asked whether this is a specific and isolable impairment or is part of a global disturbance of cognitive and attentional functions.

Method: Internal monitoring of erroneous actions, as well as three components of attentional control (conflict resolution, set switching, and preparatory attention) were assessed during performance of a single task by eight high-functioning patients with schizophrenia and eight comparison subjects.

Results: The patients exhibited no significant dysfunction of attentional control during task performance. In contrast, their ability to correct errors without external feedback and, by inference, to self-monitor their actions was markedly compromised.

Conclusions: This finding suggests that dysfunction of self-monitoring in schizophrenia does not necessarily reflect a general decline in cognitive function but is evidence of disproportionately pronounced impairment of action monitoring, which may be mediated by a distinct subsystem within the brain’s executive attention networks.

(Schizophrenia Bull 2003; 29:632–636)

Self-monitoring, the ability to control self-initiated actions and cognitive processes, is affected by schizophrenia (1–4). An important neurocognitive theory of schizophrenia (1) holds that disturbances of internal monitoring may lead to an inability to distinguish between self-generated and externally triggered activities, which in turn underlie a variety of the symptoms of schizophrenia. These theoretical considerations motivated further investigation of self-monitoring problems in schizophrenia and their relation to general cognitive functioning. The ability to detect and correct one’s errors, a task that demands attention to one’s action, has been linked to problems of internal monitor-