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**Self-Ratings of Memory Dysfunction: Different Findings in Depression and Amnesia**

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**ABSTRACT**

An 18-item self-rating test of memory functions was administered to two patient groups: seven patients with amnesia resulting from Korsakoff's syndrome and six other amnesic patients. These results were compared to results obtained previously for depressed psychiatric inpatients (n=19) and depressed inpatients prescribed electroconvulsive therapy (ECT) (n=35). The latter group was tested both before and 1 week after completion of the course of ECT. One pattern of memory self-ratings was reported by the two groups of depressed patients. These two groups reported an approximately equivalent level of impairment across all test items. A different pattern of memory self-ratings was reported by the two groups of amnesic patients and by the group tested after ECT. These patients reported considerably more impairment on some items than others, such that performance was not equivalent across test items. Finally, the patients with Korsakoff's syndrome underestimated their memory problems, reporting a less severe impairment than the other amnesic patients. The results show that the memory problems experienced in depression and in amnesia are distinguishable with self-assessment techniques. In addition, the similarity between memory self-ratings reported by patients after ECT and by amnesic patients supports the idea that memory complaints after ECT reflect primarily the experience of amnesia. Self-rating forms like the one described here may have useful application to many diagnostic groups where questions arise about the nature of reported memory problems.

Memory dysfunction is a common symptom of psychiatric and neurological illness, often occurring in the context of broader cognitive impairment. The symptoms of memory impairment can differ depending on the precipitating

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METHODS

Subjects

San Diego County (Squire et al., 1979) where they were prescribers for ECT. Depressed patients with depression, schizophrenia, or manic-depressive illness. Patients with ECT treatment were excluded from the study. Twenty-one of the 14 patients who received ECT had received it in the past 1 year. Twelve of the 14 patients who had received ECT had received it in the past 5 years. The remaining two patients received ECT in the past 10 years. One patient received ECT for a year. The remaining patients received a combination of antidepressant and antipsychotic medication, which was continued throughout the study.

Depressed patients were selected from a larger group of patients who had received ECT in the past 10 years. The selection criteria were: (a) a history of depression, (b) a depression score of at least 11 on the Hamilton Depression Rating Scale, and (c) a Hamilton Depression Rating Scale score of at least 11 on the Hamilton Depression Rating Scale. All patients were on antidepressant and antipsychotic medication, and none were on ECT.

Results

The results showed that the self-report ratings of depression were significantly lower in the patients who received ECT than in the patients who did not receive ECT. The self-report ratings of depression were significantly higher in the patients who received ECT than in the patients who did not receive ECT. The self-report ratings of depression were significantly higher in the patients who received ECT than in the patients who did not receive ECT.
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during major surgery; patient LM became amnesic in 1984 following an anoxic

episde that occurred during a seizure; patients W.H. and M.G. became amnesic in
1986 following an ischemic event. The sixth patient was N.A., who has been severely
amnesic for verbal material since 1960 when he sustained a stab wound to the brain with
a miniature fencing foil (Kaushall et al., 1981; Teuber, Milner, & Vaughan, 1968). As a
group, these six patients obtained a full scale WAIS score of 120.5 (range 104-129) and a
WMS score of 93.7 (range 81-105). Immediate and delayed recall (12 min) of a short
passage averaged 6.8 and 0 segments, respectively. Five of the patients, excepting N.A.,
averaged 28.8 and 4.4 for copy and delayed recall (12 min) of the Rey-Osterrirht figure.
N.A., whose memory impairment is primarily for verbal material, scored 33 for his copy
and 17 after a 12-min delay. For all six patients, paired-associate learning of 10 unrelated
noun-noun pairs on three successive trials averaged 5.5, 6.5, 6.7, 6.8, and 6.3 on five
successive study/test trials. For yes-no recognition of 15 old words and 15 new words,
the average score on five successive study/test trials was 24.0, 25.1, 26.2, 26.5, and 27.8.
The Dementia Rating Scale Score averaged 136.2 points out of 144. Most of the points
were lost on the memory portion of the test (5.5 out of 7.8 points). Memory
impairment was the only detectable deficit of higher functions. All six patients could
draw a cube and a house in perspective, and none had aphasia or apraxia.

Test and Procedures
Subjects responded to 18 items that asked them to rate their memory ability in several
ways (Table 2). Ratings were made on a 9-point scale from -4 through 0 to +4. Each item
asked subjects to judge their memory now, compared to an earlier indicated time period.
Depressed patients, patients tested prior to bilateral ECT, and patients tested 1 week
after bilateral ECT were asked to rate each item by comparing their current ability level
to “before I began to feel bad and went to the hospital”. The 13 amnesic patients were
asked to compare their current ability level to “before my memory problems began”.

Table 1

<table>
<thead>
<tr>
<th>Groups</th>
<th>ECT</th>
<th>Depressed</th>
<th>Korsakoff</th>
<th>Anoxic-Ishemic</th>
<th>Case NA</th>
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<td></td>
<td></td>
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</tr>
<tr>
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<td>27</td>
<td>13</td>
<td>2</td>
<td>1</td>
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<td></td>
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</tr>
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<tr>
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<tr>
<td>Education (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>12.7</td>
<td>12.5</td>
<td>11.4</td>
<td>15.6</td>
<td>13</td>
</tr>
<tr>
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<td>1.6</td>
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<tr>
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<td>9-16</td>
<td>9-14</td>
<td>13-21</td>
<td>-</td>
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</tbody>
</table>

For each item subjects were asked to judge their ability as it seemed now compared to
an earlier, specified time period. Subjects used a 9-point scale, ranging from -4 (worse
than ever before), through 0 (same as before), to +4 (better than ever before). The items
are ordered according to the score obtained 1 week after ECT. Item 1 produced the
lowest score (mean = -.25), and item 18 the highest score (mean = .06). Items 5 and 6,
and items 17 and 18 were tied. The columns of numbers to the right shows how the items
would have appeared if the ordering had been done according to the responses of the 6
non-Korsakoff amnesic patients.

Because of the relatively small number of amnesic patients, each patient was given the
self-rating scale on two different occasions separated by an average interval of 70 days.
The score for each patient was the average score obtained on each item. One of the
amnesic patients, W.H., was available for only one testing occasion.

RESULTS

Figure 1 (top) shows the results obtained with the self-rating scale before ECT and
1 week after ECT (n = 35). To display the data, the test items (1 through 18) were
ordered according to the self-ratings obtained after ECT. Thus item 1 (to the far left in
Figure 1) yielded the lowest score and item 18 yielded the highest

Table 2.

Self-Rating Scale of Memory Functions

1 My ability to search through my mind and recall names I know are there is 11
2 I think my relatives and acquaintances now judge my memory to be 1
3 My ability to hold in my memory things that I have learned is 8
4 My ability to recall things when I really try is 4
5 The tendency for a past memory to be 'on the tip of my tongue,' but not 13.5
   available to me is 2.5
6 My ability to remember the names and faces of people I meet is 5
7 My ability to know when the things I am paying attention to are going to stick 2.5
   in my memory is 8
8 My ability to remember things that have happened more than a year ago is 12
9 My ability now to remember what I read and what I watch on television is 6.5
10 My ability to make sense out of what people explain to me is 17.5
11 My ability to remember what I was doing after I have taken my mind off it for a 2.5
   few minutes is 12
12 My ability to pay attention to what goes on around me is 10
13 If I were asked about it a month from now, my ability to remember facts about 6.5
   this form I am filling out would be 9
14 My ability to recall things that happened a long time ago is 17.5
15 My ability to reach back in my memory and recall what happened a few 9
   minutes ago is 16
16 My ability to follow what people are saying is 13.5
17 My general alertness to things happening around me is 15
18 My ability to recall things that happened during my childhood is 16

- Standard deviation
Figure 1 (top). Self-ratings of memory functions before and 1 week after bilateral ECT, as assessed by an 18-item test. (Bottom). The same data are represented as best-fitting lines across the scores for all 18 test items. The order of the items, from left to right, is shown in Table 2.

Figure 2 (top). Self-ratings of memory functions on an 18-item test, as reported by depressed patients (DEP), amnesic patients with Korsakoff's syndrome (AMN-KORS), and a group of non-Korsakoff amnesic patients (AMN). (Bottom). The same data are represented as best-fitting lines across the scores for all 18 test items. The order of the items, from left to right, is shown in Table 2.

portion of Figure 2 shows the average scores for each item, as reported by the three groups. The lower portion of Figure 2 shows best fitting lines through each set of self-ratings. The slopes and 95% confidence limits for the slopes were as follows: depressed patients, slope = .010 ± .03; Korsakoff patients, slope = .060 ± .02; amnesic (non-Korsakoff) patients, slope = .090 ± .08. These data can be summarized by stating that the pattern of memory problems reported by the depressed patients resembled those obtained before ECT and that the pattern of memory problems reported by the amnesic patients resembled those obtained after ECT. The patients with Korsakoff's syndrome, however, reported less severe memory impairment than did the other amnesic patients.
Separate comparisons between groups revealed no difference between depressed patients and before-ECT patients (for the between-groups comparison, which assessed the overall severity of memory complaint, $F(1, 52) = 1.0, p > 0.1$; for the comparison of linear trends, which assessed the pattern of memory complaint, $F(1, 884) = 1.2, p > .1$). Similarly, the scores of the two amnesic groups resembled the scores of the after-ECT group (for the between-groups comparison of Korsakoff patients and after-ECT patients, $F(1, 40) = 1.5, p > 0.1$; for the between-groups comparison of non-Korsakoff amnesic patients and after-ECT patients, $F(1, 139) = .18, p > 0.1$; for comparison of linear trends, both $F(1, 42) < 2.4, p > 0.1$).

In contrast, the two groups of amnesic patients differed from both the before-ECT patients from the depressed patients not prescribed ECT, especially with respect to the pattern, i.e., the slope, of the self-ratings. First, the depressed patients differed from the non-Korsakoff amnesic patients (for the between-groups comparison, $F(1, 23) = 5.7, p < .05$; for the comparison on linear trends, $F(1, 39) = 11.6, p < .001$). The depressed patients also differed from the Korsakoff patients in terms of the slope of the self-ratings (for comparison of linear trends, $F(1, 408) = 5.1, p < .05$). Second, the scores of patients tested before ECT differed from those of the non-Korsakoff amnesic patients (for comparison of linear trends, $F(1, 663) = 5.5, p < .05$; the between-groups comparison was short of significance, $F(1, 39) = 2.5, p = .12$). Similar comparisons between the before-ECT patients and the Korsakoff patients were not significant ($F(1, 14) < 1.4, p > 0.1$).

The patients with Korsakoff's syndrome tended to report less severe memory impairment than the other six amnesic patients ($F(1, 11) = 4.1, p < .07$). Nevertheless, the pattern of complaints reported by these two groups was similar ($F(1, 187) = 1.6, p > 0.1$).

We considered that the pattern of memory complaints observed, i.e., the slope of the best-fitting line through the ordered scores from the 18 test items, might vary considerably depending on the method used to order the test items. This possibility seems unlikely for several reasons. First, the pattern of memory complaints observed before and after ECT did not change noticeably when the items were ordered according to the score obtained after ECT (as in Figure 1, this study) instead of according to the magnitude of the before ECT-after ECT difference score, as was done in a previous study (see Figure 1, Squire et al., 1979).

Second, the 18 items were also ordered according to how the non-Korsakoff amnesic patients responded (see right-most column in Table 2). Although there were some differences, this item order was rather similar to the order that resulted when the items were ranked according to the after-ECT scores ($r = .51, p < .05$). Moreover, when the results for all groups were compared using this new item order as a basis for constructing response profiles and best-fitting lines, the findings were similar to those just described. That is, depressed patients and before-ECT patients reported similar memory self-ratings (for linear trends, $p > 0.1$). In addition, the self-ratings reported by these two groups differed from those reported by the two amnesic groups (for the comparisons of linear trends, all $p < .05$, except Korsakoff patients vs. before ECT patients).

To determine the reliability of the self-rating responses made by the amnesic patients, we calculated the correlation between their responses on the two separate test occasions. Specifically, average group scores for each item were used to determine the correlation between the two sets of 18 items. For the amnesic (non-Korsakoff) patients, $r = .80, p < .001$; for the Korsakoff patient, $r = .37, p > 0.1$. This finding shows that the non-Korsakoff amnesic patients rated their memory consistently on both test occasions; however, the Korsakoff patients were not able to rate their memory in a consistent fashion. Their patients did rate the overall severity of their memory impairment similarly on the two occasions ($F(1, 6) = 0.3, p > 0.1$); but the pattern of memory impairment was rated differently (for comparison of linear trends, $F(1, 16) = 12.8, p < .001$). In contrast, the non-Korsakoff amnesic patients were consistent across the two testing occasions, both with respect to the magnitude of their rated impairments ($F(1, 4) = 1.6, p > 0.1$) and with respect to the pattern of the impairment ($F(1, 68) = .09, p > 0.1$).

**DISCUSSION**

The amnesic patients reported an experience of memory dysfunction clearly different from that of depressed patients. It resembled instead the experience reported by psychiatric patients one week after a course of bilateral ECT Amnesia is easily detectable one week after ECT (Cronholm & Bloomquist 1959, Squire, 1984; Weeks, Freeman, & Kendell, 1980). Accordingly, it seems reasonable to suppose that the memory self-ratings obtained after ECT art attributable primarily to amnesia rather than to some other factor of combination of factors.

Amnesic patients with Korsakoff's syndrome reported a less severe memory impairment than did the six other amnesic patients. Moreover, the self-ratings of the patients with Korsakoff's syndrome did not contrast as sharply as those of the other amnesic patients with the self-ratings reported by depressed patients. These findings occurred despite the fact that, as assessed by quantitative tests of memory function, the patients with Korsakoff's syndrome were as severely impaired as the other amnesic patients (see Subjects section; also see Squire and Shimamura, 1986). For example, the patients with Korsakoff's syndrome recalled an average of 4.0 words out of 15 on each of five successive learning trials, and they recognized an average of 24.1 out of 30 words across five learning trials. The corresponding scores for the six (non-Korsakoff) amnesic patients were 6.3 (recall) and 25.8 (recognition).

The patients with Korsakoff's syndrome did not reliably report their own
memory abilities. However, despite the inconsistency in their responses across two test sessions, these patients did underestimate the severity of their impairment on both occasions. In contrast, other amnesic patients appeared capable of accurate and consistent memory self-ratings. This difference between amnesic groups has also been observed with other metamemory tests, given recently to four of the six (non-Korsakoff) amnesic patients in the present study and to six of the seven patients with Korsakoff’s syndrome (Shimamura & Squire, 1986). The patients with Korsakoff’s syndrome were not able to predict their performance on a subsequent memory test, but the other amnesic patients made accurate predictions.

The difficulty that patients with Korsakoff’s syndrome exhibit in reporting their memory abilities is probably not due to diencephalic damage alone, because patient N.A. had good metamemory in the previous study and also reported his memory problems accurately in the present study. The findings for patients with Korsakoff’s syndrome may be due to the more widespread neuropathology associated with this patient group, which includes the diencephalic region as well as frontal neocortex (Shimamura, Jernigan, & Squire, in press).

It is interesting to compare the items that elicited reports of memory dysfunction in the memory-impaired groups with the items that did not elicit reports of memory dysfunction. The six items that elicited the lowest average self-rating scores (and that reflected the most severe impairment) for the after-ECT group and the non-Korsakoff amnesic group were items 2, 3, 4, 6, 7 and 11 (Table 2); the six items that elicited the highest self-rating scores for these two patient groups were items 12, 10, 14, 12, 16, 17, and 18. The former items asked about the ability to learn, retain, and recall, especially in the case of new material; and also about the judgment of others. The latter items addressed attention, concentration, immediate memory, and remote memory. Interestingly, these latter items, which were not endorsed by amnesic patients, were nevertheless endorsed by depressed patients about as readily as the other items on the test (see the before-ECT group in Figure 1 and the depressed group in Figure 2). It seems reasonable to suppose that the former items were asking about experiences likely to be associated with amnesia. Note that amnesia most severely affects new learning and memory for the recent past; whereas it typically spares immediate memory functions (including the ability to attend and concentrate), and it typically spares memory for the distant past. In contrast, the latter items ask about experiences likely to be associated with depression (e.g., impaired attention and concentration). Indeed, a sense of impaired attention and concentration might lead to an experience of impaired cognition, in general, and a tendency to endorse all items to a similar degree.

In summary, the findings show that self-rating instruments can distinguish between depression and amnesia, and they can identify those amnesic patients who underestimate their memory problems. This test might have useful application to other populations, where questions arise about the nature of memory complaints or about the relationship between self-assessment and performance.

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