Depression and the Test of Memory Malingering

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Accepted 16 March 2000

Abstract

Research on the Test of Memory Malingering (TOMM) [Tombaugh, T. N., 1996. The Test of Memory Malingering. Toronto, Canada: Multi-Health Systems], has consistently shown that it is sensitive to exaggerated or deliberate faking of memory impairment, but it is relatively unaffected by a wide variety of neurological impairments causing genuine memory dysfunction. However, there is little research on the effects that affective disorders have on the TOMM. The current study examined how inpatients diagnosed with major depression performed on the TOMM. Results show that the TOMM is unaffected by affective state. These results, combined with those from previous research, provide converging evidence that performance on the TOMM below a cutoff score of 45 cannot be attributable to depression, neurological impairment, age or education. © 2001 National Academy of Neuropsychology. Published by Elsevier Science Ltd.

Keywords: Depression; TOMM; Affective state; Memory impairment; Neurological impairment; Memory dysfunction

Neuropsychologists are frequently called upon as expert witnesses to determine the legitimacy of individuals’ claims of cognitive impairment, particularly following mild traumatic brain injury (TBI), where neurological and/or radiological evidence may be lacking. They must determine the validity of the neuropsychological assessment, stating how they know the individual was performing to the best of his/her ability during the evaluation. That is, the neuropsychologist must be able to provide evidence showing that the individual was, or was not, putting forth maximum effort and motivation during the evaluation.

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0887-6177/00/$ – see front matter © 2001 National Academy of Neuropsychology.
PII: S0887-6177(00)00064-0
Until recently, few neuropsychological instruments have been available that adequately determine when someone is not putting forth maximum effort (Nies & Sweet, 1994; Tombaugh, 1996). Research on a newly developed visual recognition test, the Test of Memory Malingering (TOMM; Tombaugh, 1996), has consistently shown that it holds considerable promise for detecting exaggerated or deliberately faked memory impairment in clinical situations. Validation studies have shown that the TOMM is a robust test that is relatively unaffected by demographic variables such as age and education or by a wide variety of neurological impairments causing genuine memory dysfunction (Tombaugh, 1996, 1997). It also has been shown to distinguish suspected malingers and simulators from those who are putting forth maximum effort (Rees et al., 1998).

There is little research, however, on the effects that affective disorders have on the TOMM. To date, the TOMM has been validated using samples of neurological patients, some who had concomitant diagnoses of depression (see Tombaugh, 1996, Appendix A). However, the TOMM has not been systematically evaluated with individuals having a primary diagnosis of depression. This lack of research is critical since depression has a strong motivational component associated with it. Depressed individuals often perceive tasks to be more difficult than they actually are and typically need much encouragement to attempt tasks. It is well established that depressed individuals fail to put forth maximum effort (e.g., Kaplan & Saddock, 1991) and this behavior is observable on neuropsychological tests requiring effortful processing, particularly memory tests.

Since the TOMM is frequently perceived to be a difficult test (Tombaugh, 1996, 1997), it is possible, perhaps even likely, that depressed individuals will fail to put forth sufficient effort thereby obtaining scores that could be misinterpreted as malingering. If the TOMM were sensitive to the effect of depression, its clinical utility with head injured patients would be compromised since TBI and depression occurs together with a high degree of frequency (Busch & Alpern, 1998; Rosenthal et al., 1998).

In light of the above, the present study undertakes to evaluate the effects of depression on the TOMM. It was predicted that the TOMM would not be sensitive to the effects of depression. This was based on the following rationale. As indicated above, depressed individuals will often perform below expectation on tasks that require effort, such as during free recall on list learning tasks; but when task demands are decreased, such as occurs with a recognition format, performance typically improves to within normal limits (Weingartner, 1986; Ouellette-Hughes, 1991; Rosenstein, 1998). Since the TOMM uses a visual recognition procedure that has been shown repeatedly to produce errorless performance in cognitively intact individuals, depressed individuals should obtain scores falling within the normal range without having to exert effortful processing.

1. Method

1.1. Subjects

Twenty-six consecutive inpatients (18 females and 8 males), recruited from an inpatient affective disorder’s unit at the Royal Ottawa Hospital, participated in this study. Mean age
and education were 40.4 years (SD = 11.2) and 14.9 years (SD = 2.8), respectively. At the
time of testing, all patients were diagnosed with an affective disorder by the staff psychiatrist
based on the criteria of the DSM-IV (primary diagnosis was major depressive disorder —
single or recurrent) (APA, 1994). All individuals were being treated for depression at the time
of testing (i.e., all were taking antidepressant medication and four participants were being
treated with electroconvulsive therapy (ECT)). Ten participants (38.5%), including the four
currently treated, had received ECT in the past. Thirty-eight percent of the sample had been
diagnosed with depression within the past year, whereas 35% had been chronically depressed
for the past 10 years or longer. The average length of hospitalization was 6 weeks.

Scores from the depressed group were compared against previous data collected with a
non-litigating, TBI group (n = 24; 9 females and 15 males), and a community sample (n = 26;
18 females and 8 males) (Rees, 1996; Tomaugh, 1997). Mean age and education of the TBI
group were 40.0 years (SD = 14) and 13.6 years (SD = 2.7), respectively. Severity of injury
was measured by length of unconsciousness as reported in participants’ medical records and
self-report (Lezak, 1995, p. 755; mild = less than 20 min; moderate = greater than 20 min, but
less than 6 h; severe = greater than 6 h). Forty percent (n = 10) of this group was experienced
in mild TBI and 46% (n = 14) was classified as severe. One subject was classified as
moderate TBI. The community sample had a mean age and education of 42.3 years (SD =
10.3) and 12.7 years (SD = 1.2), respectively.

1.2. Materials

The TOMM was presented along with a series of other tests in the following order: TOMM
learning trials, Mini Mental Status Examination (MMSE; Folstein et al., 1975), Beck
Depression Inventory (BDI; Spreen & Strauss, 1998), and TOMM retention trial.

The TOMM consisted of two learning trials and a delayed retention trial. All trials were
administered in a standardized manner. The learning trials consisted of a study and a test
phase. The study portion of each learning trial contained 50 line-drawn pictures (targets) each
presented for 3 s. During the test phase, each target was paired with a new line drawing
(distractor). The position of the target was counterbalanced for top and bottom positions. A
delayed retention trial, consisting of only the test phase, was administered approximately 10–
15 min after completion of the two learning trials. Feedback on the correctness of the
response was provided on each trial. A cutoff score of 45 was used on the second learning
trial and on the retention trial to distinguish between those putting forth maximum effort from
those with questionable motivation. The cutoff score was established during validation
studies (e.g., Rees, 1996; Tomaugh, 1996, 1997).

1.3. Procedure

Patients were informed that they would be given a series of tests that would assess their
ability to remember certain types of information, as well as to measure their level of
depressive symptomatology. Upon receiving written informed consent and prior to testing,
demographic information and medical history were obtained from each patient. Participants
were excluded if they were experiencing psychotic symptoms (e.g., hallucinations and/or
delusions), were suffering from significantly impaired attention such that he/she could not engage in the tasks, or were not fluent in English. No participants were excluded from the study, although one patient decided to withdraw from participation. On average, testing lasted approximately 1 h.

2. Results

Mean score of the depressed group on the BDI was 27.9 (SD = 13.9), indicating a moderate-to-severe level of depressive symptomatology for the entire group. The scores of 6 patients fell in the minimally depressed range (3–14), 8 were mildly depressed (17–29), and 12 were classified as severely depressed (30–51). Total MMSE scores ranged from 26 to 30 \((M = 28.7, \ SD = 1.3)\) placing them in the normal range (Tombaugh et al., 1996). A comparison of educational levels across groups revealed that the depressed group had a significantly higher level of education than the control group \(F(2,74) = 6.4, p < 0.003\). All other group comparisons were non-significant.

Frequency distributions and mean TOMM scores for each group are presented in Table 1. Inspection of Table 1 shows that on each trial the depressed group obtained the same level of

<table>
<thead>
<tr>
<th>TOMM trials</th>
<th>Groups</th>
<th>TBI control</th>
<th>Community control</th>
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<tbody>
<tr>
<td><strong>Trial 1</strong></td>
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<tr>
<td>50</td>
<td>11</td>
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<tr>
<td>&lt; 45</td>
<td>3</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Mean (SD)</td>
<td>47.8 (2.9)</td>
<td>47.6 (1.3)</td>
<td>47.8 (2.4)</td>
</tr>
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</table>

**Trial 2**

| 50          | 25     | 22          | 26                |
| 49          | 1      | 1           |                   |
| 48          |        | 1           |                   |
| Mean (SD)   | 49.9 (0.2) | 49.6 (1.3) | 49.9 (0.4) |

**Retention**

| 50          | 24     | 20          | 25                |
| 49          | 2      | 1           | 1                 |
| 48          |        | 2           |                   |
| 47          |        | 1           |                   |
| Mean (SD)   | 49.9 (0.3) | 49.6 (1.0) | 49.9 (0.5) |
performance as did the two control groups. All groups increased their performance from the first to second trial. In fact, by Trial 2 all depressed patients received a score of 49 or 50, clearly surpassing the recommended cutoff of 45. A one-way repeated measures analysis of variance (ANOVA) confirmed these observations. It yielded a non-significant main effect for group \( (F(2,73) = 5.97, p > 0.05) \) and a non-significant interaction of group by trials \( (F(4,146) = 0.14, p > 0.05) \). A significant main effect of trial was observed \( (F(2,146) = 49.4, p < 0.01) \), indicating that scores were significantly lower on the first trial compared to Trial 2 or the retention trial. A further repeated measures ANOVA was performed to determine if the different levels of depression had any effect on the TOMM. No effect of level of depression was observed: Depression \( (F(2,23) = 0.04, p > 0.05) \), Trials \( (F(2,46) = 37.1, p < 0.01) \), and Depression × Trials \( (F(4,46) = 0.07, p > 0.05) \).

Although not specifically examined in the current study due to the small sample size, ECT did not appear to affect performance on the TOMM. Four participants were undergoing ECT at the time of testing (two participants had received their fifth and sixth bilateral treatment and two participants had completed their fifth right unilateral treatment). Data from these four individuals indicate that by Trial 2, performance on the TOMM was highly accurate (100%) and was equivalent to those not undergoing ECT. The only difference between the groups was on Trial 1, where initial learning was reduced for the ECT group (raw scores: 39, 46, 47, and 49) compared to the non-ECT group.

3. Discussion

The results of the current study clearly show that scores on the TOMM were not affected by depression. All depressed individuals scored above cutoff levels on Trial 2 and the retention trial of the TOMM, achieving a 99% accuracy. These results are consistent with the literature on the effects of depression on recognition memory (Weingartner, 1986; Ouellette-Hughes, 1991; Rosenstein, 1998). That is, depression has been shown to adversely affect memory functioning that relies on effortful processing (i.e., free recall) such that performance is found to be impaired relative to non-depressed individuals. However, if task demands change to more automatic processing (i.e., recognition format) performance is typically within normal limits. In the present case, even those with severe levels of depressive symptomatology were able to learn and recognize the visual stimulus items with a high degree of accuracy.

Overall, the current results show that the TOMM is unaffected by affective state and represent further converging evidence that performance on the TOMM below a cutoff of 45 cannot be attributable to depression, neurological impairment, age, or education.

References


