

WRITTEN EXERCISE

Neuropsychologists are often called upon to make an assessment of whether someone's cognitive abilities have deteriorated. For example, if someone has sustained a traumatic brain injury (TBI) in a road accident, a neuropsychologist may be asked to assess whether this has affected their cognitive abilities. A common method of doing this involves assessing their performance on tests that are supposed to be relatively unaffected by TBIs. If performance on the test is unaffected by the TBI, then it should provide a reasonable estimate of pre-morbid ability (i.e. an estimate of the level at which the person was performing before the TBI) and this, in turn, provides a prediction about what level they should be performing at if the TBI has not affected their cognitive abilities. Actual performance on other tests that are likely to be affected by TBIs is then compared to this predicted level of performance. The comparison provides evidence of a loss in cognitive abilities if the difference between actual and predicted performance is both statistically reliable and occurs infrequently in the general population.

A common method of assessing pre-morbid ability is to use a reading test, such as the Wechsler Test of Pre-morbid Functioning (TOPF). The validity of this test depends on whether reading performance is affected by TBI. If reading performance is affected by TBI, then this reading test is likely to underestimate pre-morbid ability.

Below is a description of the Method and two tables (Table 1 and Table 2) from the Results section of a paper that investigated whether performance on the TOPF is affected by TBI. In thinking about the study, you should be aware of a number of issues about TBI. First, TBIs are commonly categorised as 'mild', 'moderate' and 'severe'. Second, cognitive abilities usually show some recovery even in cases of severe injury. Typically, once consciousness is regained, there is rapid recovery in the earlier stages, and then the rate of recovery slows and eventually plateaus. The more severe the injury, the longer the period will be in which recovery can occur. For moderate and severe injuries, improvements in cognitive abilities may still be occurring 12 months after the injury.

Method

Participants: An opportunity sample was obtained from in-patients in a rehabilitation unit. Thirty people were initially approached about participation. In all cases, there was evidence from brain scans of a TBI. Using the Glasgow Coma Scale as an index of severity, all were judged to have sustained a moderate TBI. Six people were excluded; two because they were diagnosed by a speech therapist as having an acquired reading disorder as a result of the TBI; two because an acquired speech impairment made it difficult to be sure they were reading the words correctly; and two because they were not native English speakers. This left a sample of 24 who took part in the study.

Method: Participants were tested at 3 months and then again at 6 months following their TBI. Participants completed the Test of Pre-morbid Functioning, and the Block Design and Similarities subtests of the Wechsler Adult Intelligence Scales. Performance on Block Design and Similarities is often impaired in moderate TBI.

Hypotheses: It was expected that there would be significant improvement on Block Design and Similarities, but no significant improvement on the TOPF.

Results

Test	Mean (standard deviation) at 3 months	Mean (standard deviation) at 6 months	t-value	p-value
TOPF	35 (4.3)	37 (4.0)	1.01	.352
Similarities	12 (3.8)	17 (3.6)	2.16	.040*
Block Design	44 (6.3)	53 (5.8)	2.96	.009*

Table 1: Mean raw scores and t-tests.

*p<.05

Raw scores across tests are not comparable because they are scored on different scales.

Test	Mean	Range	Percentage of sample who showed a reliable increase in their score
TOPF	+2.4	-1 to +10	28%
Similarities	+5.1	+1 to +7	40%
Block Design	+9.3	0 to +12	62%

Table 2: Difference scores. Difference scores were calculated by subtracting the individual's score at 3 months from their score at 6 months. Column 4 shows the percentage of the sample whose scores showed a statistically reliable increase from 3 to 6 months (i.e. the increase was due to genuine change, rather than to any unreliability of the test).

Instructions for completing the test

YOU MUST ANSWER ALL QUESTIONS

- Please indicate clearly on your script which question you are answering.
- Your answers will be marked on your written presentation as well as on content. Therefore:
 - Please ensure that you write in full sentences. Do not write in note form.
 - Avoid errors of punctuation, spelling and grammar.
 - Take time to proofread your answers at the end, and ensure that your meaning is clear.

Question 1: Write a brief summary of the results of the study. Focus on stating the facts, rather than providing an interpretation of the results. (4 marks)

Question 2: What are the methodological limitations of the study? For each limitation you mention, make sure that you explain why it creates a problem for the interpretation of the results. (14 marks)

Question 3:

Suppose in clinical practice you were dealing with an individual who satisfied all the inclusion/exclusion criteria for this study (i.e. moderate TBI, English as first language, no articulation difficulties or diagnosable reading difficulties). Are you convinced by the results of this study that the TOPF will provide an accurate estimate of this individual's pre-morbid functioning? Make sure that you justify your answer. (4 marks)

Written presentation: Marked on spelling, grammar, punctuation and clarity of meaning. (8 marks)