The effects of Traumatic Brain Injury on Complex Figure Test performance.

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ABSTRACT

Patients with Traumatic Brain Injury (TBI) have performed below norms on the Complex Figure Test (CFT) and this has been attributed to lack of organization (Binder, 1982). The present study compared 105 TBI subjects with 59 Controls in terms of accuracy and organization to examine whether lower TBI subject organization was associated with subsequent lower accuracy. Results showed that TBI subjects scored lower accuracy than controls on copy, recall and delay trials but did not score lower for organization (as measured by Hamby, Wilkins & Barry, 1993). Both groups were consistent in organizational approach across the three CFT trials, and copy organization scores of both groups were positively correlated with accuracy scores on recall and delay trials. This suggests that TBI subjects do have a problem with the CFT, but it cannot be linked to copy organization on the basis of evidence from the present study. The unexpected results were attributed to methodological problems involving the population samples and the organization measure.

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CHAPTER 1: INTRODUCTION

Traumatic Brain Injury (TBI) is the most common cause of brain damage (Kurtzke, cited in Lezak, 1995), and has become "a major health problem in westernized nations" (Jennett & Macmillan, 1981). The economic and social costs associated are high.

Those who are most at risk from TBI are males aged between 15 and 24 years, who typically sustain their injuries in motor vehicle accidents (MVA) (Bond, 1986). These typically result in closed-head injuries (open-head injuries account for only 2-6% of all cases). Damage is caused by the initial blow, shearing strain (which damages major neural pathways), and secondary injuries such as haemorrhage and hematoma. Neuropsychological consequences generally consist of impairment in attention, memory, behaviour and personality, and language and communication. Of these, memory impairment is the most common problem reported after TBI by patients and their families (Bond, 1986). The basis for the memory difficulty appears to be at the encoding stage, where material is organized for storage (Craik & Lockhart, 1972).

Assessment after TBI is essential as it outlines the nature and extent of difficulties. Many deficits detected in this way may be linked to injuries which are not immediately obvious, and those that are obvious may be confused with other disturbances. Neuropsychological assessment focuses on such faculties as general intelligence, attention, memory, and personality factors. One of the most commonly used tests of memory is the Rey Complex Figure Test (CFT), developed in 1941 by Andre Rey. The task requires a subject to copy a complex

geometric figure, then redraw it from memory, first after a brief period, then after approximately 30 minutes.

An organized approach to the CFT involves drawing elements of the base rectangle first, then methodically filling in the various details. Previous research has shown that a disorganized copy of the CFT results in a lower score than an organized approach (Binder, 1982; Klicpera, 1983; Bennett-Levy, 1984; Heinrichs & Bury, 1991; Hamby, Wilkins & Barry, 1993). Those with TBI tend to make disorganized copies, and consequently obtain lower accuracy scores than non-brain injured subjects (Binder, 1982). One of the drawbacks of Binder's (1982) study is that the method of evaluating organization was extemely basic. For example, elements in each CFT drawing were rated only as either correct, missing or fragmented, further only 14 subjects were included in each group. More recently, Giarratano and Tate (1993) modified the test providing 12 TBI patients with an organized approach (by systematically presenting broken-down segments), and brain injured subjects' recall was equivalent to non-brain damaged controls.

The present study represents an attempt to re-examine the relationship between TBI and organization on the Rey CFT using a larger sample of TBI subjects. The accuracy of TBI subjects was investigated, in order to confirm that this group scored lower than controls. These subjects were also expected to use a more fragmented approach to the task. The consistency of TBI and control group use of strategy was compared, and finally the relationship between copy organization and recall and delay accuracy was examined.

The following chapters provide background information and theory relevant to the study. Chapter 2 includes an overview of important theoretical advances relating to memory. Chapter 3 looks at TBI: its incidence and classification, and the consequences of the condition. Chapter 4 examines the Rey CFT, its application to TBI patients and the various methods of scoring the test. Chapters 5 to 7 describe the objectives and hypotheses of the present study, the methodology used in their examination, and the results. The discussion in chapter 8 interprets the results, compares them to previous research, and finally, makes suggestions for future research.