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2016
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EARLY RECOVERY PROFILES OF LANGUAGE AND EXECUTIVE FUNCTION IN BILINGUAL PERSONS DURING THE FIRST TWELVE WEEKS POST BRAIN INJURY

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ABSTRACT

Background: The nature, rate and pattern of recovery in bilingual persons following brain damage has been investigated over many years but several controversies remain. Recent evidence suggests that the relationship between executive function (EF) processes and language recovery may be distinct in bilinguals. An improved understanding of such underlying linguistic and cognitive processes may enhance assessment and treatment particularly in the acute phase. There is limited knowledge regarding how these processes interact in the acute phase and there remains little guidance as to the choice of an appropriate assessment battery for bilinguals. In the South African context, bilingual persons with a brain injury are often treated as monolinguals due to the language challenges and the lack of standardised assessments. Thus there is a need to develop a simple, effective battery which is able to differentiate aetiologies, is sensitive to recovery processes, and in a multicultural and multilingual context is able to distinguish normal from pathological profiles.

Aims: The research study aimed to identify an assessment battery for language and EF that is sensitive to etiology and the recovery process for South African bilingual persons who have had a neuronal insult. It also aimed to evaluate the linguistic and executive function skills of bilingual patients with acquired neurological communication disorders (ANCD) at two time periods within the first 12 weeks post injury. A further aim was to profile the recovery of bilingual persons with ANCD in the acute recovery phase according to etiology (Right CVA, left CVA and TBI).

Method: A multivalent comparison study with a longitudinal component was conducted at two acute rehabilitation centres. A convenience sample of 29 bilingual, second language English speaking participants (19 with a cerebral vascular accident (CVA) and 10 with a traumatic brain injury (TBI)) were assessed at two time periods within the first 12 weeks post injury. They were assessed using the Comprehensive Aphasia Test (CAT) and a nonverbal EF battery. The nonverbal battery comprised tasks to assess updating (n-back task), mental shifting (number-letter task; Wisconsin Card Sorting test), and inhibition (Victoria Stroop; Tower of Hanoi). A control group of 19 neurologically intact bilingual, second language English speakers who were matched according to age and education level were assessed employing the same battery. The control group completed an initial assessment and then were reassessed six weeks later.

Results: The CAT was found to be a suitable assessment measure when assessing bilingual, second language English speakers in the South African context. A between- group analysis identified statistically significant differences between etiologies (including the control group) for language assessment as well as the EF assessment, indicating the battery was able to differentiate normal from pathological individuals. While most of the test battery was found to be suitable for the participants, the Tower of Hanoi and the number-letter task were deemed inappropriate for the population and the cultural context. Overall the battery of tests distinguished between aetiologies, testing period (first and second) and pathological from normal individuals. It was found that this battery was appropriate for a variety of cultural groups. A within- group analysis determined that there were unique profiles of language and

EF skills according to etiology and that different profiles of change emerged according to each etiology for both language and EF subtests.

Discussion: The streamlined battery that was found to be beneficial and sensitive to the multicultural and multilingual nature of South Africa comprised the CAT as the language assessment and the n-back task (updating), Victoria Stroop (inhibition) and WCST (shifting) comprised the EF assessment battery in the acute phase.This study confirms prior research on recovery processses in language across the three aetiologies but also highlights changes in excutive functioning which may offer some explanations for differential recovery profiles. The results highlighted that inhibition may be a preserved bilingual advantage in participants with a right CVA or TBI. However, it was a deficit in participants with a left CVA. The role of inhibition may support the decision making process with regards to the language for therapy. Thus the EF profiles may also assist a clincian to determine whether to undertake monolingual or bilingual therapy There were also distinct relationships between language skills and EF skills for each etiology according to time frame. This provided insight into the interactions between language and EF during the acute phase of recovery. Knowledge of the specific EFs that interact with language recovery per etiology can assist a clinician in providing effective therapy in the acute phase that complies with neuroplasticity principles.

Conclusion: Language assessment and treatment in the acute phase needs to be provided in combination with an understanding of recovery patterns, what is driving that pattern, and which cognitive deficits are contributing to the language behaviour. In addition clinicians need to be aware of the impact of updating, shifting and inhibition in a bilingual person as well as the role bilingual advantage may have in decision making for therapy, the recovery process and as a possible tool to support the therapeutic process.