**Keywords:** Bilingualism; Executive functions; Flexibility; Inhibition and updating

Numerous studies have been comparing the cognitive and especially executive functioning of bilingual and monolingual subjects. We have already presented former results (SOFMER 2010) showing an adult bilingual advantage (subjects aged from 20 to 60 years old) for response time in several tasks calling for the executive components of Inhibition and Updating according to Miyake’s model (2000). The aim of the present study is to compare the executive functioning of bilingual and monolingual teenagers.

**Subjects and methods.**—The scores of 20 bilingual teenagers (16–18 years old) were compared to those of monolingual teenagers, matched on age and certain socio-demographic variables. The protocol included several verbal and non-verbal tasks assessing the three components: flexibility (verbal and graphic fluencies), updating (Updating test) and inhibition (Go/NoGo).

The results of an analysis of variance with three factors [language (bilingual/monolingual); executive components (flexibility/inhibition/updating); material (verbal/non-verbal)] showed a triple interaction between the three factors. This triple interaction is due to the fact that overall, bilinguals obtain better results in the non-verbal component, and especially for the flexibility task, whereas monolinguals do better in the verbal condition in the same task.

**Discussion.**—Our results are consistent with a large part of the literature showing that bilinguals perform better than monolinguals on non-verbal executive tasks, whereas monolinguals do better on verbal ones.

**Conclusion.**—We will discuss our results in relation to those obtained with adult subjects, showing that those executive skill profiles could reverse with age.

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**CO43-007-e**

**Personalized rehabilitation of cognitive functions based on simulated Activities of Daily Living (sADL)**

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**Keywords:** Brain injury; Cognitive rehabilitation; Virtual Reality; Simulated Activities of Daily Living (sADL); Virtual Therapeutic Scenario (VTS)

Cognitive impairments are a major factor of loss of autonomy and dependence. Each year in France, more than 25,000 people, mostly young adults between 15 and 25 years, suffer from cognitive impairment resulting from Traumatic Brain Injury (TBI), especially after a road accident. At the same time, more than 130,000 people suffer a disabling stroke. Rehabilitation interventions are needed to enable these people to recover capacity and return to instrumental Activities of Daily Living (iADL), such as grocery shopping. Unfortunately they are difficult to carry out and often below the expected efficacy. The assets of virtual reality to address this big problem of public health are today scientifically recognized. In this context, we designed the AGATEH tool (Adaptable, configurable and upgradable tool for the generation of personalized therapeutic applications in cognitive rehabilitation) (AGATEH project, ANR-09-TECS-002). The first objective was to provide therapists with an innovative means of dealing with cognitive rehabilitation and, to offer patients personalized rehabilitation sessions, on the basis of simulated Activities of Daily Living (sADL).

AGATEH core leans on a virtual neighborhood where functional places are positioned (town, studio, post office, supermarket). Each functional place is conducive to functional tasks or specific sADL (topographic tasks, post mail, shopping...). During the session and the Virtual Therapeutic Scenario (VTS), the participant’s activity is measured through indicators that provide a picture of the participant’s functioning.

The aim of the paper is to present the rationale of the design of AGATEH tool as well as preliminary results collected among therapists and participants with brain injury regarding usability issues.

**Further reading**


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**CO43-006-e**

**Cognitive disorders following out-of hospital cardiac arrest**

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**Keywords:** Cardiac arrest; Cerebral anoxia; Cognitive disorders

**Objectives.**—To analyse the cognitive disorders following an out-of-hospital cardiac arrest.

**Material/patients.**—Retrospective and prospective study including 49 patients (35 men, 14 women, mean age 43 years, SD: 13.3), followed-up in a department of Physical Medicine and Rehabilitation.

**Methods.**—Comprehensive neuropsychological assessment of each cognitive function, performed at a mean delay of 13.6 months (median: 5 months, range: 1 month–9 years) post cardiac arrest. Longitudinal study of 14 patients, who have been re-evaluated 25 months (median: 16 months, range: 5 months–7 years and half) on average after the first assessment.

**Results.**—The first assessment highlighted various pictures. Over 90% of patients had attentional and dysexecutive disorders. Moderate to severe anterograde amnesia was present in 80% of the group. In 40% of cases, memory disorders were due to a storage dysfunction. However, they were most often increased (or even caused) by the attentional and dysexecutive deficits. Retrograde amnesia and instrumental disorders (agnosia, apraxia or language deficit) were present in about 50% of patients. The second assessment indicated significant improvement in most patients (13/14), even if some deficits persisted, especially attentional and executive deficits.

**Discussion.**—Isolated amnesic syndrome was not found in this sample. All the deficits we highlighted in the first assessment have previously been described in the literature. However the deficits were more frequent and more severe in our sample. In the literature, the frequency of cognitive deficits is highly variable (11%–80%). It depends on inclusion criteria, tests’ sensitivity and delay post-anoxia. The important improvements observed in the second assessment are probably due to spontaneous recovery, as well as to rehabilitation. This leads to recommend systematic assessment after the acute phase, such as in a Physical Medicine and Rehabilitation department. Cognitive deficits should be thoroughly explored. Adequate rehabilitation should be proposed when needed.

**Further reading**


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