

## In Search for the 'Bilingual Advantage' in Immersion Education

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**Abstract :** Background: Previous studies have shown that 'full' bilingualism seems to enhance the executive functions in children, young adults and elderly people. Executive functions refer to a complex cognitive system responsible for self-controlled and planned behavior and seem to predict academic achievement. The present study aimed at investigating whether similar effects could be found in children learning their second language at school in immersion education programs. Methods: In this study, 44 children involved in immersion education for 4 to 5 years were compared to 48 children in traditional schools. All children were between 9 and 11 years old. To assess executive functions, the Simon task was used, a neuropsychological measure assessing executive functions with reaction times and accuracy on congruent and incongruent trials. To control for background measures, all children underwent the Raven's coloured progressive matrices, to measure non-verbal intelligence and the Echelle de Vocabulaire en Images Peabody (EVIP), assessing verbal intelligence. In addition, a questionnaire was given to the parents to control for other confounding variables, such as socio-economic status (SES), home language, developmental disorders, etc. Results: There were no differences between groups concerning non-verbal intelligence and verbal intelligence. Furthermore, the immersion learners showed overall faster reaction times on both congruent and incongruent trials compared to the traditional learners, but only after 5 years of training, not before. Conclusion: These results show that the cognitive benefits found in 'full' bilinguals also appear in children involved in immersion education, but only after a sufficient exposure to the second language. Our results suggest that the amount of second language training needs to be sufficient before these cognitive effects may emerge.

**Keywords :** bilingualism, executive functions, immersion education, Simon task

**Conference Title :** ICLLL 2015 : International Conference on Languages, Literature and Linguistics

**Conference Location :** Paris, France

**Conference Dates :** July 20-21, 2015