Working memory capacity and structure in monolinguals and bilinguals

Farzaneh Anjomshoae[1], Elena Nicoladis[1], Rielle Gagnon[2]

University of Alberta, Department of psychology
University of Alberta, Department of psychology

Anjomsho@ualberta.ca,Elenan@ualberta.ca, Rielle1@ualberta.ca

Working memory (WM) is defined as a limited capacity memory for keeping and processing information in mind for a short time. There have been debates on whether knowing more than one language leads to advantages in WM capacity. In the current study, we tested whether there are WM capacity or structure differences in monolingual, bilingual and multilingual adults. WM models often distinguish between verbal and visual stores. We predicted: 1) there would be greater working memory capacity for each additional language known and 2) bilinguals and multilinguals would show greater integration between verbal and visuospatial memory than monolinguals. 60 monolingual, 101 bilingual, and 28 multilingual adults were asked to complete verbal (Digit Span) and visuospatial WM (Corsi Block) tasks, both forward and backward. The results showed little difference in WM capacity between the three groups. Principal component analysis revealed two WM components for bilingual and multilingual groups: 1) visual WM (forward and backward) and 2) verbal WM (forward and backward). In contrast, only one WM component was observed among the monolinguals. These results suggest greater specialization in WM modality among speakers of multiple languages. Future research will test whether these differences are causally linked to the acquisition of multiple languages.