Predicting the semantic neural representations in Korean-Chinese early bilinguals

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Abstract: Unlike conventional activation-based brain mapping, multivariate (or multi-voxel) pattern analysis (MVPA) has been widely used to accurately predict behavioral variables encoded in a neuronal system.

Our research based on MVPA attempts to prove whether it is possible to identify the semantic neural representation when performing language switching. Five early Korean-Chinese bilinguals participated in our fMRI experiments where trials consisted simultaneously of semantic difference (mammal /tool) and language switching (Korean /Chinese). The participants were requested to do a property generation task in L1 (L2) for each orthographic stimulus in L2 (L1) presented as caption for the picture stimulus. It turned out that the semantic identification accuracy was significantly high and immune to the effect of the language switching, but the language as a target was not identified as accurately. However, regions of interest in bilingualism were confirmed by important voxels with language identification accuracy considerably higher than semantic identification accuracy.