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Recognizing Famous Faces and Buildings: An ERP-Analysis of Repetition Priming

In order to fully understand differences in the recognition of faces and other types of objects, features apart from the general visual category have to be considered, such as visual expertise and the categorization level (Tarr & Cheng, 2003). I will present data from a study where we directly compared the behavioural performance and event-related potentials (ERPs) for faces and buildings that could be likewise accessed at the exemplar level in a repetition priming paradigm.

For all participants individual sets of 64 pictures of each, familiar faces and familiar buildings, were selected and intermixed with the same number of unfamiliar stimuli. Participants had to perform a familiarity-decision task. EEG was recorded from 64 channels.

Analysis concerned the priming (primed and unprimed), the different categories (buildings and faces) and the level of specificity (familiar and unfamiliar). Reaction times (RTs) revealed reliable priming effects for both categories. The early ERPs of interest, the P100 and the N170, were smaller in amplitude or even absent, respectively, and delayed for buildings compared to faces. Results showed a very distinctive ERE/N250r to both categories with larger amplitudes for familiar than for unfamiliar targets. Topographic comparisons suggested the same underlying source of the ERE/N250r for familiar faces and familiar buildings, whereas priming effects in the late repetition effect (LRE/N400) revealed different scalp topographies for faces and buildings.

These findings suggest that after differential perceptual processing the initial access to a common store of structural knowledge is followed by the activation of category-specific cortical representations of person- and building-related semantic knowledge.