

Effect of expectations on picture-flavor learning : an fMRI data analysis

Context: Understanding the processes of associative learning is an important topic for decision-making and cognitive neurophysiology research. Detection of prediction errors by the dopaminergic brain system has been described as one of the important components of associative learning. However, existing models do not account for the importance of the context on sensory stimuli perception. It has been shown that external information about a sensory stimulus that a subject is about to receive could influence the perception of this stimulus upon its reception. For example, received stimulus can be described as being identical to the expected stimulus even when a difference exists between the two. Such misperception would affect prediction error detection and, as a consequence, the associative learning itself. The objective of this internship is to study how expectations could impact prediction error detection and the learning of picture-flavor associations.

Project objectives: The student will work with a functional MRI dataset acquired during a food behavior study. During this study, healthy volunteers were shown pictures predicting delivery of sweet drinks. Picture-drink associations were either previously learnt by subjects, or were novel for subjects. The internship will focus on the study of the manner in which flavor expectations induced by pictures, and in particular the assimilation effect produced by expectations, modify learning of novel picture-flavor associations.

Study methodology: behavioral data modeling, model-based fMRI data analysis (classical GLM and parametrical models).

Candidate profile: a Master in neurobiology or affiliated field, knowledge of fMRI technique and analysis methods (experience with SPM8 package is a plus), good programming skills (R, Matlab), skills in cognitive psychology.

Project duration: 6 months (starting date and exact duration can be adjusted; optimal beginning date January to February 2017)

The internship will take place in UMR914 PNCA (Physiology of Human Nutrition and Eating Behavior) – AgroParisTech, INRA, Université Paris-Saclay. Analyses will be carried out in collaboration with UR370 QuaPA, INRA Saint-Genès-Champanelle.

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