Institut de Neurociències

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Postdoctoral Candidate Interested in Applying for MSCA-IF In

Brain Mechanisms of Language Learning

Are you a postdoctoral researcher thinking about your next career move? The Marie Sklodowska-Curie (MSCA) Individual Fellowships are a great option if you are an experienced researcher looking to give your career a boost by working abroad.

Universitat de Barcelona- a leading European University- allows you to work in a first class research environment while benefitting from an attractive salary to cover living, travel and family costs.)

Brain Mechanisms of Language Learning group
PI: Ruth de Diego Balaguer (Link)
An interdisciplinary group with an international projection integrated within a larger Unit, the Cognition and Brain Plasticity Unit (www.brainvitge.org), at the University of Barcelona. This Unit is composed of five groups (Dyamics of Memory Formation leaded by Dr. Lluis Fuentemilla, Learning from Reward leaded by Dr. Josep Marco-Pallarés, Brain Plasticity leaded by Antoni Rodriguez-Fornells and Diffusion MRI and Brain Connectivity leaded by Estela Cámara). The group works in different but complementary topics and methodologies. The Unit is characterised by its multidisciplinarity, grouping PIs, Post-docs, Master and PhD students coming from different disciplines (Physics, Biology, Neurology, Psychology, Engineering, Filology) and by a high level of interaction between the groups attested by co-supervised Thesis and co-authored papers from different lines of research. The group attracts increasing number of international students coming for long and short visits or doing their PhDs.

Project description
Our sense of time and of the temporal relationship between events helps us anticipate the future and respond faster to our environment. This ability is most important for music or language that, by their own nature, are made of auditory sequences unfolding in time. Temporal expectations can derive from the intrinsic characteristics of the stimuli such as their regular rhythm or from the arbitrary association of a cue with a temporal interval. Both these different types of temporal expectancies are present in language. On the one hand, regular rhythmic information is embedded in speech by the syllable rate and by the weak-strong syllable pattern characterising prosody. On the other hand, in morphosyntactic dependencies, certain arbitrary elements such as the presence of "is" in English predicts the suffix "–ing" after the verb appearance (e.g. is play-ing). There is a tight relationship between the two types of cues and indeed prosodic cues boost learning of syntactic dependencies.

The present project aims at unravelling by which mechanisms rhythmic cues present in language capture exogenous attention but also help to guide endogenous attention to the relevant elements that contain predictive information for upcoming dependencies.

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The project is to study the earliest more automatic effects, captured by rhythmic cues, and how these rhythmic cues guide endogenous attention. The project is organised in two parts. The first part will observe the EEG modulations produced by manipulations of saliency and rhythm to tackle how prosody affects attention teasing apart whether rhythm or simply saliency is the key factor that correctly drives endogenous attention to focus in the relevant cues for learning. On the other hand, the timing system engaged by a rhythm appears to be mediated by striatothalamo-cortical loops, and it is partially involved in making subsequent predictions. Thus, the second part of the project will focus on the role of the striato-cortical connectivity with the motor and the fronto-parietal attentional systems. The current project will improve our understanding of language learning and the important role of the different attentional systems to shape this process. It will also shed light on the still barely known role of striato-cortical connectivity on language learning.

Requirement/Skills/Qualification
- The candidate should hold a PhD in Cognitive Neuroscience. Previous work in Attention and /or Language learning or related topics and experience with EEG and/or MRI would be ideal. Experience with DTI analysis would be a plus. Programming skills and knowledge in the use of experimental software is necessary.
- English: Excellent
- Spanish: Good

Support for applicants
International Research Projects Office offers support to applicants (eligibility check, info sessions, feedback on the draft proposal) and has recently launched a Mentoring programme specifically designed for MSCA applicants (subject to availability).

Submission
Please submit your application (CV and letter of interest) directly to: Ruth de Diego Balaguer (Ruth.dediego@ub.edu)

Applicants will be interviewed and equal opportunities will be applied in the selection process.