

Recursive Hierarchical Embedding in the Visual, Motor and Musical Domains

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Complex hierarchical structures occur in language, music and action planning. In these domains, it is difficult to establish the boundaries of hierarchical depth, especially when external memory resources are available. Recursive hierarchical embedding is probably a key capacity to achieve this power.

In this talk, I will summarize the results of our research program aiming at describing the cognitive architecture underlying the representation of recursive hierarchical embedding. After conducting a series of behavioral and fMRI experiments in the visual, musical and motor domains, we found that, behaviorally, the acquisition of recursive rules seems supported by cognitive resources that are general across domains. However, when we test well-trained participants in the fMRI, their representation of recursion seems supported by retrieving representations stored in (visual, musical and motor) domain-specific repositories. This suggests that the resources necessary to acquire recursive rules are different from those necessary to utilize these rules after extensive training.