Hierarchies in scenes – the role of object functions in shaping semantic networks

Word limit: 250

Scene-grammar describes a set of rules regarding the likely identity and position of objects within scenes. In this framework, local objects in scenes cluster around *anchor objects* forming *phrases* – meaningful subunits - where anchor objects serve as strong predictors for the spatial layout of scenes. Carrying out actions probably plays a great role in shaping the hierarchical structure of scenes. However, we know little about whether this hierarchical structure of object-object and object-scene relationships assumed within the scene grammar framework is also reflected in the network of actions afforded by objects in the scene. To this end, we conducted two online experiments. In Experiment 1, we compared distributions of actions named for anchor and local objects and found evidence that anchor objects are associated with more actions than local objects. Object clusters based on the similarity of associated actions resembled clusters based on the spatial layout. In Experiment 2, we asked participants to explicitly rate relatedness between objects and actions in an action-primed object recognition task followed by an old/new memory task. There was no evidence that the action priming modulated memory encoding. However, the hierarchical structure assumed under scene grammar with varying levels of relatedness (*related* = same scene, same phrase; *unrelated* = same scene, different phrase; *semantically unrelated* = different scene) was reflected in the relatedness ratings. Our results support the idea that the hierarchical structure of scenes is also reflected by the actions associated with objects in scenes.

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