

Title: Scene Grammar Acquisition Through Visual Statistical Learning

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Statistical learning (SL) enables pattern extraction of syllables as well as simple visual relations between stimuli. However, little research has explored the complexity of possible patterns extracted by SL. Based on the scene grammar framework, which refers to relations between objects in a naturalistic scene, we constructed three artificial scenes with imaginary objects. Four larger objects in each scene served as so-called anchors, while eight smaller objects were used as local objects. Two locals were placed close to one of the four anchors in 80% of the trials respectively, thus defining the relationships between them. Our final sample consisted of 24 participants who completed 20 trials in a passive condition, where participants looked at every object once, and 20 trials in an active condition, where participants actively searched for an object, consequently interacting more with the scene. After each condition, participants were shown object pairs and rated how likely the objects were to be found close to each other. In these inquiries, participants showed a profound differentiation between object relations in line with their frequency of co-occurrence. When the inquiry followed the active condition, the correct differentiation of object relations was more profound. This stresses the importance of active engagement rather than passive exposure to visual environments for successful SL in artificial scenes, which might be also a driving force for efficient scene grammar learning in the real world.