

Morphemes as letter chunks: Linguistic information enhances the learning of visual regularities

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Introduction: *Using an artificial script, we have previously demonstrated that readers use co-occurrence statistics to learn about the presence and position of affix-like chunks in strings of pseudo-letters (Lełonkiewicz, Ktori & Crepaldi, 2020). These findings were taken as evidence that visual statistical learning might be implicated in morphological processing during visual word recognition. In a series of experiments, the present study seeks to specify further this claim by (a) establishing the visual, language-agnostic nature of the underlying learning mechanism and (b) examining it in the presence of higher-order linguistic information.*

Methods: *In Experiment 1, skilled readers were familiarized with strings comprising random shape sequences and affix-like chunks of frequently co-occurring shapes. In a design replication, Experiment 2 used letter strings. In Experiment 3, one participant group was familiarized with letter strings preceded by pictures representing a particular semantic category, whereas in another group, white-noise squares were used. In a later testing phase, all participants saw previously unseen strings that either contained an affix in the same position as in the familiarization, an affix in a different position, or no affix. Participants' task was to judge whether these new strings belonged to the familiarization set. Affix presence and position effects were assessed with generalized mixed-effects models.*

Results: *Results revealed that participants were more prone to ascribe a previously unseen string to the familiarization set if it contained an affix and if the affix appeared in the same position as in the familiarization. Evidence for the participants' sensitivity to the presence and position of chunks within strings was obtained in all three experiments. Importantly, however, these effects were stronger when readers were exposed to letter strings, which allowed access to orthographic and phonological representations (Experiment 2), and were further enhanced by access to semantics (Experiment 3).*

Discussion: *The present findings demonstrate that the learning of visual regularities supports chunk identification both in purely visual and language-like materials, but also that the availability of linguistic information (phonology and semantics) enhances this learning. These findings pave the way to a comprehensive theory of morphological learning and processing in visual word identification.*

References: Lełonkiewicz, JR et al., *J Mem Lang* (2020) 115:104152

Keywords: Language; normal population; not relevant; behavioural, statistical learning.