Contributions of implicit and explicit knowledge to distributional learning

Cylcia Bolibaugh¹, Patrick Rebuschat²

¹University of York, United Kingdom
²Lancaster University, United Kingdom

Mastering a second language involves learning any number of semi-productive patterns (e.g. verb-argument construction alternations, Japanese word order scrambling, slot fillers in idiomatic constructions), and such patterns are often deemed to be best acquired incidentally from extensive language exposure. Although a growing number of studies have investigated the extent to which adult learners are able to generalise beyond specific linguistic instances when these are incidentally encountered in the input, far fewer have explored how adults learn to appropriately restrict these generalisations under such conditions.

In the present study, we investigated the types of knowledge which underlie acceptance (generalisation) and rejection (discrimination) of novel strings following passive exposure to an artificial language following a (Q)AXB(R) pattern. In an auditory exposure condition, adults (n=16) passively listened to the language. In a semantic referent condition, participants (n=16) listened to the language while viewing line drawn illustrations of scenes in which the AXB elements were mapped to agents, actions and objects. Thus participants heard exactly the same language, but whereas the auditory condition provided only distributional information based on the patterning of the words in sentences, participants in the semantic condition benefitted from a correlated cue to word class category structure. Participants in both conditions were then asked to rate trained and novel sentences. After each rating, participants were asked whether they had made their decision based on memory of specific exemplars, rules, intuition or guess.

Findings suggest that distributional learning in adults relies on explicit memory based processes which bias learners to generalise more widely than the statistical evidence warrants, and rule based knowledge appears to be necessary to appropriately restrict generalisations. Where the stimulus environment enables greater confidence in the systematicity of the underlying structure (via correlated semantic cues), learners more readily formulate rules and concomitantly more accurately restrict their generalisations.

Keywords: distributional learning, implicit and explicit learning, restricting generalisation, grammaticality.