

From Item to System: how cultural evolution creates linguistic structure in an iconic modality

Human language is striking in the way it exhibits systematic structure at all levels of description, something not found anywhere else in nature. Previous research using iterated learning of artificial languages has shown how systematic compositional structure can emerge through a cultural evolutionary process. However, there are a number of aspects of these experiments that are unrealistic. In particular, the initial setup of the experiments is typically a language that is completely arbitrary and unstructured. This is very different from the cases of language emergence we can actually observe in the real world: emerging sign languages.

In these cases, the initial state is certainly not arbitrary. Instead, sign languages are thought to emerge from improvised gestural communication that is highly iconic. Indeed, in recent years there has been a realisation that iconicity is a design feature of all languages, both signed and spoken. How does iconicity interact with systematicity in the cultural evolution of linguistic structure? In this talk I will present a series of experiments that use the artificial sign language learning paradigm to answer this question. I will show that initially holistic iconic gestures get replaced by systematically structured compositional ones as language is transmitted over generations of learners. I will argue that this explains the gradual emergence of segmented manner/path description in Nicaraguan Sign Language, for example.

More generally, these results show that communicative strategies that are optimised for conveying individual items are replaced over time by strategies that are optimised for being learned as a system. Linguistic systems are adapted for learnability: the inevitable result of cultural transmission.