

Simplicity and informativeness in the cultural evolution of language

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Language is shaped by competing pressures from learning and communication: The learning pressure favours simplicity, while the communication pressure favours informativeness. This has been demonstrated in a variety of typological studies, computational simulations, and laboratory experiments. However, a recent paper by Carstensen et al. (2015) showed that the learning pressure alone might be sufficient to give rise to informative languages. We present two artificial category learning experiments that aim to shed some light on this.

In the first experiment, participants were asked to learn and recall one of three semantic category systems. The three systems differed in their learnability and we found that, as predicted, the simpler category systems were easiest to learn, while the more informative system was the hardest to learn. We followed this with an iterated learning experiment, in which participants learned and produced category systems, the output of one participant being the input to the following participant in a transmission chain. Unlike Carstensen et al. (2015), the languages converged on the simplest systems rather than the most informative one.

Our analysis suggests that two semantic features are important for understanding this result: expressivity (the number of meaning distinctions), where the two pressures work against each other, and convexity (an efficient organization of the meaning space), where the two pressures are aligned. We argue that future work should carefully consider the role of these two features when studying the causal mechanisms involved in the cultural evolution of language.