

Simplicity and informativeness in conceptual structure

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Languages are shaped by pressures to be both simple and informative. In general, simple languages are not informative, and informative languages are not simple; during cultural evolution, languages find an optimal balance between these two properties. I argue that learning (specifically, induction from incomplete, noisy data) functions as the pressure for simplicity, while communicative interaction functions as the pressure for informativeness.

In this talk I will first present a Bayesian model of category/word learning. I argue that learning is best viewed as a model selection problem in which a simplicity prior plays an essential role in allowing agents to reason about unseen items and to avoid overfitting noise in the data stream. This model demonstrates that simple, structured, learnable concepts can emerge from very general principles when a language is transmitted from one agent to the next. I then show that an experimental analogue of this model returns strikingly similar results.

Finally, I consider another hypothesis that has been advanced in the literature – namely, that learners have a prior bias for informativeness – and I show why this is unlikely in light of my findings.