

# Modelling the role of joint attention in the emergence of syntax through pragmatic plasticity

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Human communication has become more and more complex over the past million years. Two transitions are particularly intriguing: the transition from non-symbolic to symbolic language and the transition from holistic to compositional language. Viewing language not as a rigid code linking forms to meanings, but as a pragmatically very flexible system, allows one to explain both transitions as having occurred gradually ([2], [5]). My primary research goal is to model computationally the evolution of compositional syntax in such a system.

The project is a continuation of Hoefler's PhD thesis [3], applying the general principles he developed to a more concrete setting, with meanings being sets of first-order logical formulae rather than constants, and forms being ordered strings rather than abstract labels. I will explain how the new model, which is based largely on recent work by Hoefler, deals with various aspects of this richer representation, such as symbol grounding and word-order.

The exemplars acquired by the agents in the model strongly resemble constructions in Construction Grammar, as described for example by Croft [1]. An advantage of this resemblance is that the languages emerging in the simulation can be analysed in a way similar to Croft's analysis of natural language. I will explain how this works and hopefully present some early results, depending on my progress.

With the transition from non-symbolic, non-compositional communication systems to symbolic, compositional language made easy, the question remains which cognitive developments enabled language to thrive in the human species. I will discuss a couple of candidates, in particular the ability to achieve joint attention as described by Tomasello [4], and explain how I intend to simulate joint attention in the current model.

## References

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- [4] Tomasello, M. (2008). *Origins of Human Communication*. MIT Press.
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