UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Modelling the Emergence of Positional Compositional Structure

Permalink

Journal

Authors

Coxe-Conklin, Henry
Frank, Stella
Truswell, Robert
et al.

Publication Date

2020

Copyright Information

Peer reviewed

Modelling the Emergence of Positional Compositional Structure

Henry Coxe-Conklin
University of Edinburgh, Edinburgh, United Kingdom

Stella Frank
University of Edinburgh, Edinburgh, United Kingdom

Robert Truswell
University of Edinburgh, Edinburgh, United Kingdom

Kenny Smith
University of Edinburgh, Edinburgh, United Kingdom

Abstract

In a compositional language the meaning of a sentence is a function of the meaning of its parts and the way they are combined. Recent computational models of the emergence of compositionality have focused on the emergence of words which encode sub-units of meaning in sub-units of form. Decidedly less attention has been paid to the emergence of rules governing the combination of these words. Our work uses LSTM networks in an iterated learning set-up to provide an account of how some aspects of compositional structure may emerge through cumulative cultural evolution. We present a novel metric for assessing the degree of positional structure present in an emergent model and use it to illustrate how canonical word order may emerge naturally in LSTM models. This supports the notion that some elements of linguistic structure result more from the dynamics of language transmission and use than domain-specific cognitive biases.