

The Research Group  
**Artificial Intelligence Lab**

has the honor to invite you to the public defense of the PhD thesis of

**Hannah LITTLE**

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

*It's not all in your Mind: Modality Effects on the Emergence of Combinatorial Structure*

Promotor:

**Prof. Bart De Boer**

The defense will take place on

**Friday November 17 2017 at 17:00 h**

in Auditorium E.0.12 at the campus  
Humanities, Sciences and Engineering of the  
Vrije Universiteit Brussel, Pleinlaan 2 - 1050  
Elsene, and will be followed by a reception.

**Members of the jury:**

Prof. Suzanne Kieffer (chairman)  
Prof. Bart De Boer (secretary)  
Prof. Katrien Beuls  
Prof. Piet Van de Craen  
Prof. Simon Kirby (University of Edinburgh)  
Prof. Simon Garrod (University of Glasgow)

**Curriculum vitae**

**Career highlights:**

Lecturer in Science Communication,  
University of the West of England

Associated Researcher Max Planck  
Institute for Psycholinguistics

PR Officer for the International  
Association of Cognitive Semiotics

**Previous Education:**

MSc Evolution of Language and  
Cognition - University of Edinburgh

BA (First Class Hons) English Language  
and Linguistics - University of York

**Abstract of the PhD research**

Where did structure in language come from? Previous work in evolutionary linguistics has tackled this question focusing on cognitive biases in interaction with learning and communication. In contrast, work on the evolution of speech has focused on physical features of the vocal tract. In this thesis, I bridge the gap between these two fields and investigate how a linguistic modality (speech or sign) affects the emergence of combinatorial structure in language. This is the level of structure where meaningless building blocks combine to make meaningful utterances.

There have been some differences observed in how structure emerges and is used in different modalities in the real world. For example, in emerging sign languages a level of combinatorial structure is very slow to emerge. Here, I test different hypotheses about what may cause these differences.

Using artificial language experiments with continuous audio signals, I manipulate signal spaces to investigate how features of linguistic modalities affect the emergence of combinatorial structure. I investigate the effects of size and dimensionality of the signalling space, and how easy it is to generate clear signal-meaning mappings. I also consider how pressures for brevity, discrimination and processes such as conventionalisation affect the emergence of combinatorial structure.

Overall, the experiments demonstrate that the features of a signalling modality affect signal-meaning mappings, having knock-on effects on signal structure. This has implications not only for the emergence of structure in real world languages, but also in the design of artificial signal spaces for experimental work, and the validity of generalisations from previous experimental results.