

The Research Group

Artificial Intelligence Lab

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

Sabine van der Ham

to obtain the degree of Doctor of Sciences

Title of the PhD thesis:

Investigating Cognitive and Functional Biases for Learning Acoustic Categories

Curriculum vitae

Promotor:

Prof. dr. Bart de Boer

The defense will take place on

Tuesday, September 7, 2021 at 14h00

The defense can be followed through a live stream. Contact

sabinevanderham@gmail.com for more information

Members of the jury

Prof. dr. Geraint Wiggins (VUB, chair)

Prof. dr. Beat Signer (VUB, secretary)

Prof. dr. Esi Struys (VUB)

Prof. dr. Monica Tamariz (Heriot-Watt University, Scotland)

Prof. dr. Tessa Verhoef (Leiden University, the Netherlands)

In 2006, Sabine started her academic career studying English Language and Culture at Rijksuniversiteit Groningen (RuG) in the Netherlands. In 2011, she graduated from the Research Master Linguistics (also RuG). After working on a number of linguistic research projects in Berlin, she started her PhD at the AI lab of the VUB, under the supervision of Bart de Boer.

As of October 1st, she will be working as associate lecturer in research methods at NHL Stenden Hogeschool in Leeuwarden, The Netherlands.

Abstract of the PhD research

Do cognitive adaptations related to language exist? A broad spectrum of theoretical accounts exists that aim to explain human language abilities and how these abilities emerged or evolved. However, many of the properties of language can be explained by the effects of cultural evolution: the constant interaction between language learners results in a learnable (i.e. structured and compressible) language for its speakers.

That does not mean that nothing could have evolved for language: after all, cultural evolution intrinsically depends on the cognitive abilities of its learners. I propose that we should investigate 'continuously variable cognitive traits that are used in language'. These cognitive abilities can optimize under pressure from the cultural environment, and are therefore suitable candidates for empirical investigation into cognitive adaptations related to language.

In the current thesis I aim to uncover two potential cognitive adaptations for learning language-like sound categories, by investigating whether learning and producing such categories show indications of optimization related to speech.

In my experiments, human participants are trained on artificial sound categories. I manipulate the distribution of the sounds in the training set to examine whether learners produce even more extreme categories than what they have observed (Experiment 1), as well as the type of signal that they have to learn (Experiment 2) to examine whether learning and production is affected by signal and modality type. I also investigate the role of functional pressure in learning, producing and communicating signals (Experiment 3).

Although the experiments are unable to provide unequivocal evidence for language related cognitive adaptations, the current line of investigation is able to provide a relevant contribution to the discussion of whether and how cognitive adaptations can or should be investigated.