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PhD position interview for SFB 1102 – Project C3

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Academic background

- → M.A. in **Theoretical and Experimental Linguistics**, Université Paris Diderot
 - Courses: syntax (e.g. HPSG), semantics (e.g. predicate logic; event-based semantics), pragmatics, language acquisition, etc.
 - Master thesis: A Rational Speech Act model of cross-linguistic pronoun resolution preferences (Prof Dr. Barbara Hemforth, Dr. Heather Burnett)
- → Summer schools in 2016: ESSLLI and Trieste Encounters on Cognitive Science
 - Intro to distributional semantics, CCG, Information Theory
- → M.Sc. in Language Science and Technology, Saarland University
 - Courses: computational psycholinguistics, connectionist language processing, neural networks, statistical natural language processing, statistics, *etc.*
 - Research assistant at Project A1
 - Current master's thesis: a Self-Paced-Reading study of forward and backward inference generation

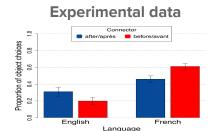
A Rational Speech Act model of cross-linguistic pronoun resolution preferences (Master's thesis 1)

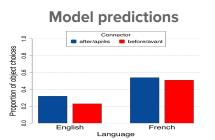
Different pronoun resolution preferences for ambiguous pronouns across languages:

- → Subject preference in English + German
- → Object preference in French

A **Gricean reasoning + frequency-based** approach:

- 1. Corpus study: collect the frequency of an alternative construction with obligatory subject co-reference
- 2. Integrate corpus study results into an RSA model of cross-linguistic pronoun resolution as languageand construction-specific costs
- 3. Compare model predictions with **new experimental data**

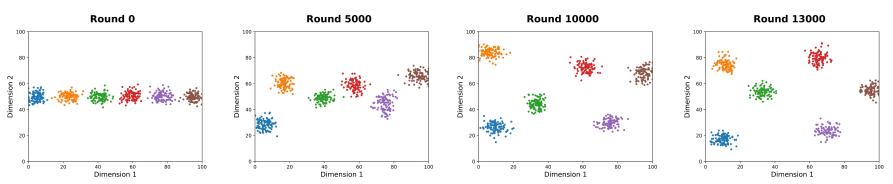




A multi-level exemplar model of the evolution of sound-category systems

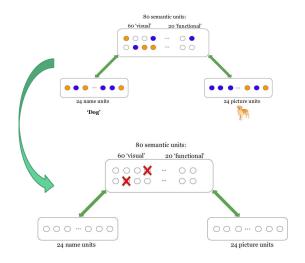
- → Term paper for the seminar *Exemplar Theory* by Prof. Dr. Bernd Möbius
- → A Python implementation of the **exemplar model of variation & evolution** in the sound system by Winter & Wedel (2016)
- → **Hidden (sublexical) variation** creates pathways for future change of the linguistic system

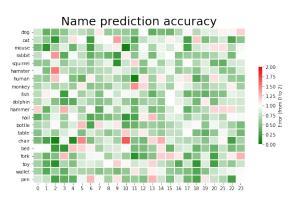
Evolution of the sound-category system over 13000 dialogue turns in the model:

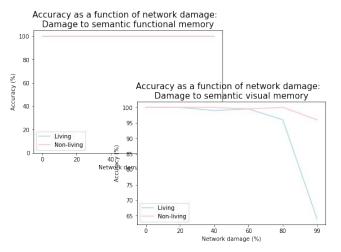


A simplified re-implementation of a connectionist model of semantic memory impairment

- → Course presentation+project for the course Cognitive Neuropsychology by Prof. Dr. Axel Mecklinger
- → Simplified reimplementation of the Farah & McClelland (1991) model in PyTorch
- → Brain lesions simulated by **setting connection weights to zero** in visual *vs.* functional semantic memory







Current master's thesis: Inference generation during reading

Research questions:

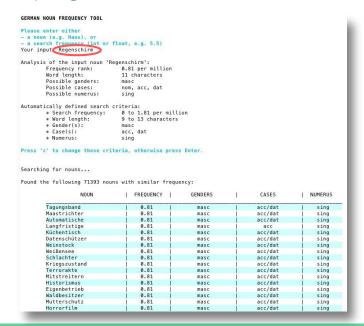
- 1. Do reading times for the generation of bridging inferences covary with the P600 effect observed by Burkhardt (2007)?
- 2. [How] do the behavioral correlates of inference generation differ from a failure to achieve coherence?
- 3. Can the use of a forward inference encouraging task facilitate the production of forward inferences?

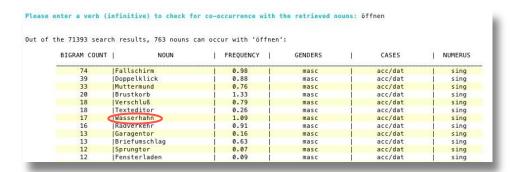
Method:

- Two self-paced reading studies
- SPR1: bridging (backward) inferences
- SPR2: predictive (forward) inferences (= SPR1 with a different task)

German noun frequency tool for stimuli creation

- A python program that lets the user search through a list of German nouns sorted by frequency (constructed from the deWaC corpus), controlling for gender, case, number (using DEMorphy)
- → https://github.com/miriamschulz/German_noun_frequency_tool





Summary: Research interests

- → Going beyond the *what* towards the *why* of linguistic structure and language use:
 - Which cognitive factors and biases contribute to shape human language?
 - How can the human brain process language?
 - Which role do extra-linguistic context, general world knowledge as well as prediction play in language processing?
- → Opportunity to zoom in on a single problem in depth during the PhD
- Integration of Surprisal Theory, psycholinguistic research, and cognitive modeling in Project C3

References

Burkhardt, Petra. 2007. The P600 reflects cost of new information in discourse memory. *Neuroreport* 18, no. 17: 1851-1854.

McClelland, James L., and M. J. Farah. 1991. A Computational Model of Semantic Memory Impairment: Modality Specificity and Emergent Category Specificity. *Journal of Experimental Psychology*.

Schulz, Miriam, Heather Burnett & Barbara Hemforth. 2019. A Rational Speech Act model of cross-linguistic differences in pronoun resolution preferences. Poster presented at *CUNY Conference on Human Sentence Processing*, Colorado Boulder. DOI: https://doi.org/10.13140/RG.2.2.24487.80805

Schulz, Miriam, Heather Burnett & Barbara Hemforth. 2021. Corpus, experimental and modeling investigations of cross-linguistic differences in pronoun resolution preferences. *Glossa: a journal of general linguistics* 6(1): 66. DOI: https://doi.org/10.5334/gjgl.1142

Winter, Bodo, and Andrew Wedel. 2016. The Co-evolution of Speech and the Lexicon: The Interaction of Functional Pressures, Redundancy, and Category Variation. *Topics in cognitive science* 8, no. 2: 503-513

Thank you