

Research Group Prof. Dr. Markus Werning

The following Master project proposals are from year 2022. They can give you an impression which kind of projects are possible in the department of Philosophy of Language and Cognition.

Master Projects related to the DFG-Project: The Interaction of Bayesian Pragmatics and Lexical Semantics in Linguistic Interpretation: Using Event-related Potentials to Investigate Hearers' Probabilistic Predictions

Master Project:

In the context of the above mentioned DFG-project we offer a number of master theses on language comprehension:

- a) Master theses that are largely experimental and based on EEG experiments on language comprehension
- b) Master theses with a more theoretical focus on probabilistic models on language comprehension.

How do discourse contexts influence the way sentence meaning is composed from lexical meaning? We contrast two views of how contextual influence can be explained. The Semantic Similarity View maintains that discourse context affects sentence meaning mainly because of the semantic similarity between the words in the discourse context and the words in the target sentence (e.g., as in semantic priming, Otten & Van Berkum, 2008). The Free Pragmatic View, in contrast, defends the claim that also pragmatic aspects of the discourse context, other than the mere resolution of indexicals and anaphors, can immediately affect sentence meaning composition, allowing for a free pragmatic enrichment at any stage of sentence meaning composition (Recanati, 2010). Our project aims at adjudicating between these competing views. To this aim, we introduce a Predictive Completion Task in which the hearer at every moment in a communicative situation has to generate a probabilistic prediction about how a sentence/discourse being uttered by the speaker will be continued (Cosentino et al., 2017). The Semantic Similarity View and the Free Pragmatic View make different predictions as to how this task will be solved by the hearer. These predictions can be quantitatively determined, on the one hand, by using Latent Semantic Analysis (Landauer & Dumais, 1997) to obtain semantic similarity values and, on the other hand, by adopting the framework of Bayesian Pragmatics (Frank & Goodman, 2012) to calculate the pragmatic influence. We use the so-called Qualia Structure introduced in the Generative Lexicon approach by Pustejovsky (1995) as a model of lexical structure and focus on how discourse contexts interact with the Telic, the Agentive and the Formal components in the lexical entry of concrete nouns. We will test the predictions of the Semantic Similarity and the Free Pragmatic view in EEG using the empirically well-established observation that the conditional probability of a word given a preceding context is negatively correlated with the amplitude of its N400 component. In the light of the experimental data we will combine tools of formal semantics with those of Bayesian Pragmatics to develop a model of how discourse context affects the composition of sentence meanings by means of free pragmatic enrichment. We expect the results of the project to have a major impact on the debate in the

philosophy of language between Semantic Minimalism and Truth-Conditional Pragmatics, and especially on whether compositionality should be understood in a more or less rigorous way. We aim at readjusting the principle of compositionality in a way that is consistent with the experimental findings. The project may also gain insight into the structure of mentally represented lexical and sentence meanings and the neuro-cognitive processes underlying lexical retrieval and sentence meaning composition.

Literature

Frank, M. C., & Goodman, N. D. (2012). Predicting Pragmatic Reasoning in Language Games. *Science*, 336, 998.

Cosentino, E., Baggio, G., Kontinen, J., & Werning, M. (2017). The time-course of sentence meaning composition. N400 effects of the interaction between context-induced and lexically stored affordances. *Frontiers in Psychology*, 8(818). DOI: 10.3389/fpsyg.2017.00813.

Landauer, T. K., & Dumais, S. T. (1997). A solution to Plato's problem: The latent semantic analysis theory of acquisition, induction, and representation of knowledge. *Psychological Review*, 104, 211–240.

Otten, M., & Van Berkum, J. J. A. (2008). Discourse-Based Word Anticipation During Language Processing: Prediction or Priming? *Discourse Processes*, 45, 464–496.

Pustejovsky, J. (1995). *The Generative Lexicon*. Cambridge, MA: MIT Press. Recanati, F. (2010). *Truth-Conditional Pragmatics*. Oxford University Press.

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Master Project: Humour and Irony: Understanding what makes utterances funny.

In the context of the above mentioned project we offer a number of master theses on the comprehension and cognitive effects of irony and humour:

- a) Master theses that are largely experimental and based on EEG experiments
- b) Master theses with a more theoretical focus, both philosophical and linguistic.

In this project we employ perspectives from philosophy, linguistics, psychology and neuroscience to study the nature, the semantics and pragmatics as well as the psychological effects of humour and irony.

Literature:

Hurley, M. M., Dennett, D. C., Adams Jr, R. B., & Adams, R. B. (2011). *Inside jokes: Using humor to reverse-engineer the mind*. Cambridge, Mass.: MIT Press.

R. W. Gibbs & H. L. Colston (Eds.), *Irony in language and thought: A cognitive science reader*. New York, London: Psychology Press.

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Master Projects related to the DFG-Project: Theory of situated linguistic meaning

The project is part of the Research Training Group "Situated Cognition".

Master Project:

In the context of the above mentioned DFG-project we offer a number of master theses on language comprehension:

- a) Master theses that are largely experimental and based on EEG experiments on language comprehension
- b) Master theses with a more theoretical focus on situated linguistic meaning.

Contemporary naturalistic theories of linguistic comprehension can be classified along two dimensions: The first one regards the extent to which semantic comprehension involves embodied brain processes. Here amodal-symbolic and embodied-emulative views compete over the question whether the meanings of a sentence and its parts are mental symbols largely decoupled from sensory, motor and emotional processes or whether sentence meaning consists in the sensorily, motorily and emotionally grounded emulation of a model of the sentence (Werning, 2004, 2005a, 2005b, 2010, 2012; Mroczko-Wąsowicz & Werning, 2012). The second dimension concerns the extent to which contextual factors influence the intuitive truth-conditions of sentences and, more precisely, whether the compositionality of language has to be accounted for in a stricter or more liberal way (Werning, 2004, 2005c; 2015; Werning et al. eds., 2012). Whereas semantic minimalism claims that intuitive truth-conditions are fully determined in a bottom-up compositional manner where only indexical and anaphors may carry a context argument, truth-conditional pragmatics holds that context factors can freely modulate the intuitive truth-conditions at any stage of sentence meaning composition. The two dimensions are closely intertwined with each other and with the viability of a situated theory of linguistic meaning. Taking into account recent empirical results and abiding by the rigorous standards of semantics, this PhD project aims at developing an embodied-emulative and context-sensitive theory of meaning and will thus contribute to a comprehensive theory of situated cognition. There will be two foci: (i) the interaction between telic lexical components and contextually induced ad-hoc affordances (Cosentino, Baggio, Kontinen, Garwels, & Werning, 2014) and (ii) the interaction between empathy and the understanding of emotion words.

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Master Projects related to projects P3, P6 and P10 of the DFG research group Constructing Scenarios of the Past: A New Framework of Episodic Memory.

More information on P3, P6, P10: <https://for2812.rub.de/>

The offered master theses focus on topics at the interface between psychological and neuroscientific accounts of episodic memory, on the one hand, and the philosophy, phenomenology and epistemology of memory on the other hand.

Many memory theorists have postulated memory traces as a means by which information about events experienced in the past is stored such that this information, at a later point in time, can be recalled for the purpose of remembering (De Brigard, 2014). A preservationist view of memory traces is part and parcel of the Storage Model of episodic memory. In the philosophy of memory, the preservationist view is subsumed under the Causal Theory of Memory, which has been developed by Martin & Deutscher (1966) and more recently defended by Bernecker (2010). The main goal of the project, on the one hand, is to criticize the preservationist notion of memory traces, as defended by the Causal Theory, and to replace it with a minimal generative notion of memory traces in the framework of Trace Minimalism (Werning, 2020). On the other hand, the project also opposes the radical denial of memory traces. The view that remembering need not be coupled to experience through any causal link, but, just like imagination, merely consists of a simulation of a past episode, is called simulationalism and has recently been proposed by (Michaelian, 2017).

In the project, Trace Minimalism (Werning, 2020) will be defended against the three alternative views. It will be shown that the assumption of a minimal memory trace that constitutes a causal link and merely carries some physical information, rather than mental representational content suffices to fulfill the desiderata on a relation between remembering and experience. We will here largely exploit an analogy between perception as prediction of the present and episodic memory as "prediction of the past" within the predictive processing framework (Hohwy, 2013). Minimal traces will thus be shown to (i) provide an appropriate content relation, (ii) account for the reference of a remembering, (iii) render episodic memory epistemically reliable, and (iv) avoid the problem of relearning. Furthermore, the view of memory traces developed in Trace Minimalism will be integrated into a revised version of the Sequence Analysis (Cheng & Werning, 2016; Cheng, Werning, & Suddendorf, 2016).

Literature

- Bernecker, S. (2010). *Memory : a philosophical study*. Oxford University Press.
- Cheng, S., & Werning, M. (2016). What is Episodic Memory if it is a Natural Kind? *Synthese*, 193, 1345–1385. <http://doi.org/10.1007/s11229-014-0628-6>
- Cheng, S., Werning, M., & Suddendorf, T. (2016). Dissociating memory traces and scenario construction in mental time travel. *Neuroscience and Biobehavioral Reviews*. <http://doi.org/10.1016/j.neubiorev.2015.11.011>
- De Brigard, F. (2014). The Nature of Memory Traces. *Philosophy Compass*, 9(6), 402–414. <http://doi.org/10.1111/phc3.12133>
- Hohwy, J. (2013). *The Predictive Mind*. Oxford: Oxford University Press.
- Martin, C. B., & Deutscher, M. (1966). Remembering. *Philosophical Review*, 75, 161.
- Michaelian, K. (2017). *Mental Time Travel*. Cambridge, MA: MIT Press.

Werning, M. (2020). Predicting the Past from Minimal Traces: Episodic Memory and its Distinction from Imagination and Preservation. *Review of Philosophy and Psychology*, 11, 301–333. doi: 10.1007/s13164-020-00471-z

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