

Coping with Polysemy MIC3 Working Group

Contact: Louise McNally (louise.mcnally@upf.edu)

Background:

1. Distributional semantic (DS) word representations (at least as originally developed) are "overspecified" in the sense that they do not distinguish between "properly linguistic" meaning and general conceptual content, and representations reflect the sum total of information that can be extracted from a word based on its use. Meaning composition in context serves to narrow down the space of interpretive possibilities. Polysemy resolution is a filtering problem. This approach to word representation is very powerful, offering good models of phenomena like metaphor, and has some support in the psycholinguistics literature on priming/activation. However, overspecification is very different from the formal semanticists' view that word representations include only "literal" meaning and that polysemy resolution is about monotonically adding information in composition. Insofar as the Rational Speech Act (RSA) model crucially builds on the idea of a "literal" listener, it presupposes this latter sort of word representation. Though the two types of representation can be seen as two sides of the same coin, it's not obvious that they are straightforwardly intersubstitutable. **Question 1: How would the RSA model work with DS-style overspecified meaning representations?**

2. Crucial to RSA is the idea that we reason probabilistically about meaning in context by considering a rather limited set of alternative utterances. This assumption does a huge amount of work (and could do even more for a wider variety of polysemy resolution problems than I think have been considered so far in the RSA literature). To my knowledge, there is nothing like this at work in distributional models. **Question 2: (How) could we bring the RSA notion of alternatives into distributional modeling to improve meaning composition in context?**

3. Though this is a bit of a side point, in reading the DS and RSA literatures, I get the impression that probabilistic reasoning is being used in different ways. I want to take the opportunity of having DS and RSA community members in the same room to answer **Question 3: How are DS and RSA currently using probabilistic reasoning?**

Tentative schedule

Tuesday morning/early Tues. afternoon:

- Brief introductions (1 minute - no need to prepare anything)
- Introduction to the topic and discussion of plans for the WG (Louise)
- Short overview of RSA+Lexical uncertainty (Noah Goodman). Suggested background reading:
 - Goodman and Frank (2016): <https://cocolab.stanford.edu/papers/GoodmanFrank2016-TICS.pdf>
 - Scontras ESSLLI course materials (includes interactive WebPPL tutorial): <http://gscontras.github.io/ESSLLI-2016/>
- Probabilistic semantics in combination with distributed or closely related models (Katrin Erk). Suggested background reading:
 - Erk 2015: <http://semprag.org/article/view/sp.9.17>
- Discussion / clearing up of Question 3
- The discourse dimension (?). Suggested background reading:
 - Paperno, et al. 2016: <https://arxiv.org/pdf/1606.06031.pdf>
- Specific plans for the rest of the working group

Rest of Tuesday afternoon: Discuss/work!

Wednesday morning:

- Finish up work from Tuesday
- Wrap-up and preparation for plenary session