Measuring named-entity ambiguity

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Motivation

Why are some products more successful than others?

It depends on audience perceptions and preferences

One theory:

Ambiguity is rewarded in some markets

e.g. venture capital, scientific research

And penalized in others

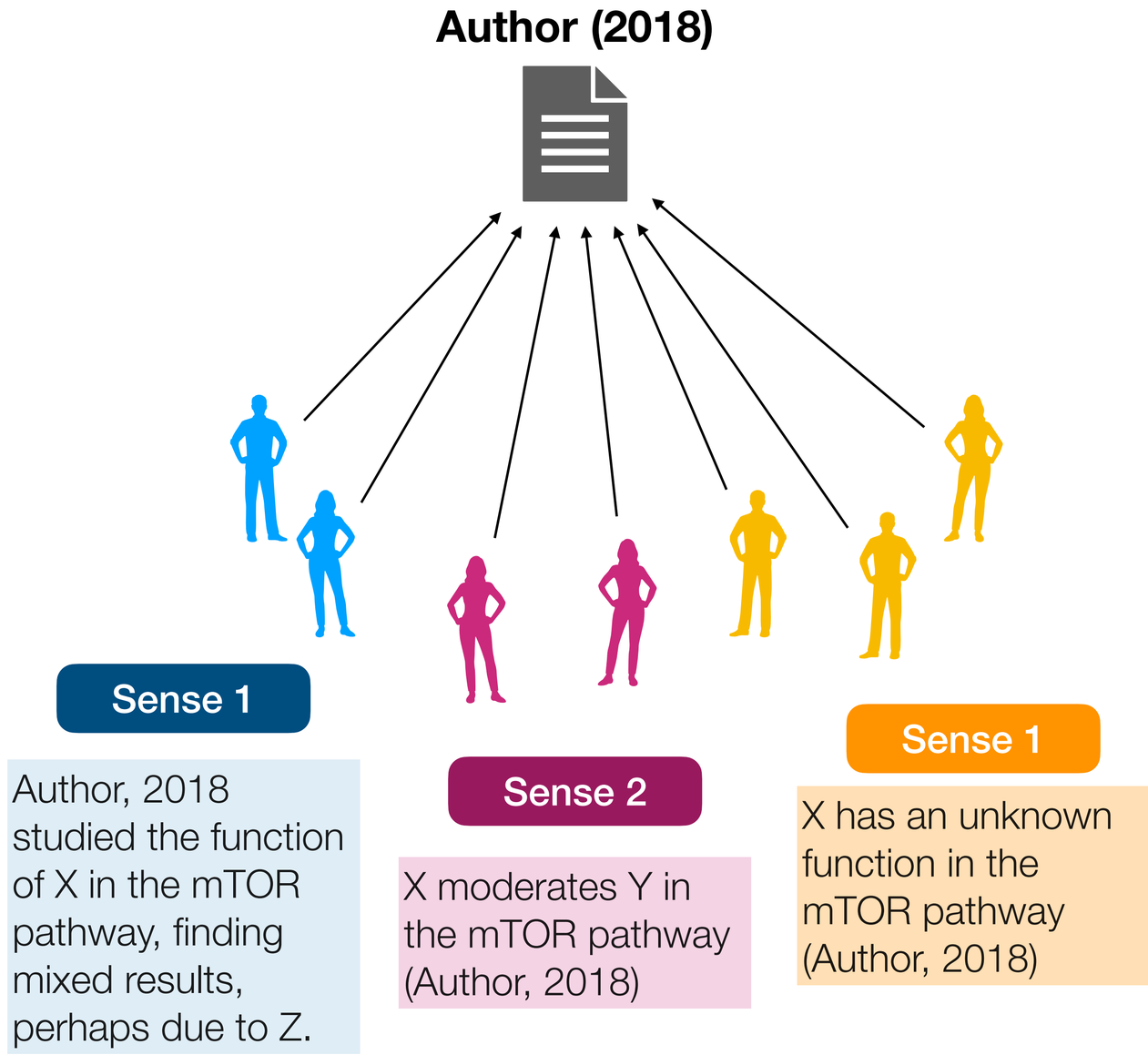
e.g. movies, wine

But scholars rarely measure ambiguity directly.

Inferred from product features

Or assumed based on market outcomes

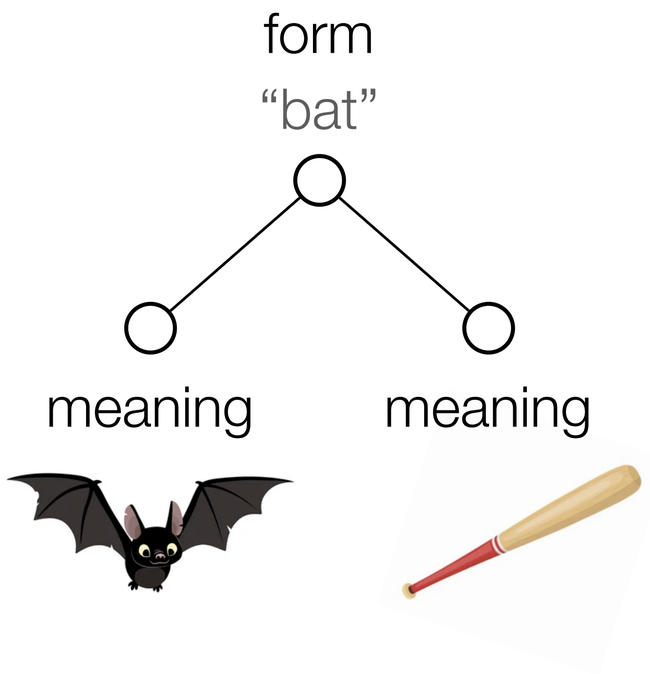
Linguistic problem: named-entity ambiguity



Definitions

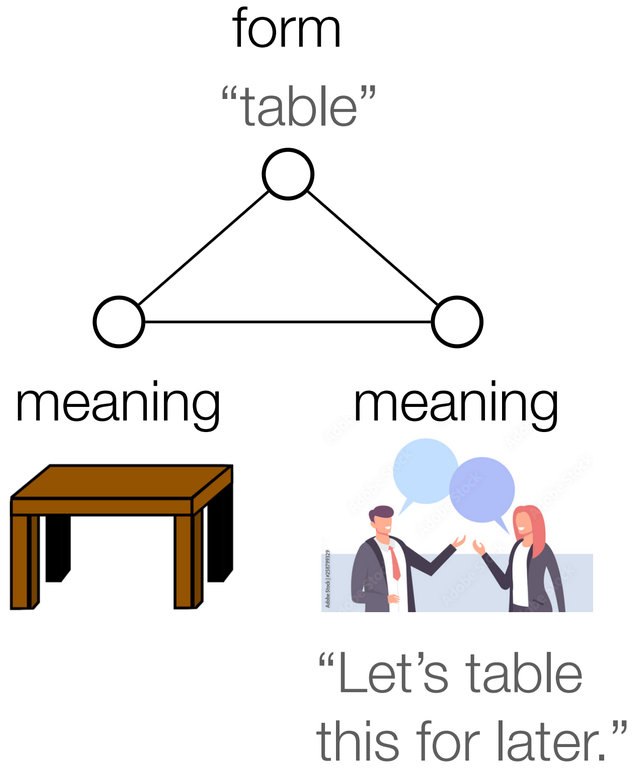
Difficult to distinguish between the two! Tuggy, 1993

Ambiguity



Meanings are unrelated

Polysemy



“Let’s table this for later.”

Meanings are related

Measurement

How can we measure the extent of ambiguity / polysemy of an entity?

Surveys

Ask people “does this have one or multiple meanings” Veronis, 1998; McMahan and Evans, 2018

Contextual Diversity

Sense comes from context, contextual diversity is a proxy for polysemy

- Co-occurrence Networks Hamilton et al. 2016
- Embeddings Reisinger and Mooney, 2010; Arora et al. 2018

Classification Inference

Each form has a discrete distribution of senses. Probability that we can correctly infer the sense of a word from its context is a proxy for polysemy / ambiguity.

- Information Theoretic McMahan and Evans, 2018
- Bayesian Inference Hannan et al. 2019

Conclusions

Moving Forward

-Contextual diversity seems the most tractable

- Doesn’t require an assumption that senses are discrete
- Co-occurrence networks + local clustering coefficient
- Embed sentences (contexts) in which an entity is named + density-based clustering measure (e.g. radius of gyration)

Challenges

- Difficult to resolve individual v.s. collective ambiguity
  - Audience-specific measures?
- Distinguishing between ambiguity, polysemy and vagueness

Thank You!

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