Combining Word Patterns and Discourse Markers for Paradigmatic Relation Classification

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Paradigmatic Relations

(cf. Murphy'03)

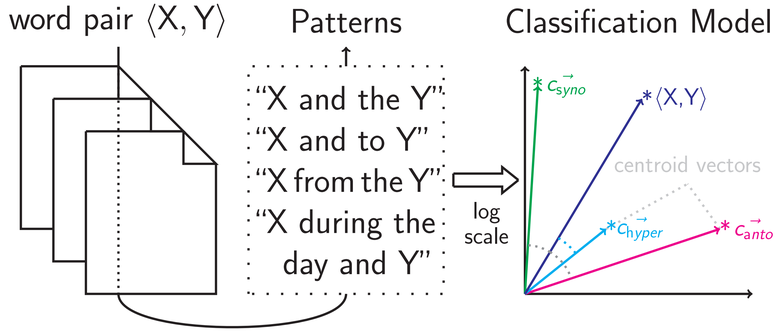
- Difficult to distinguish using distributional information (e.g., "The kid/child$_{syno}$ loves/hates$_{anto}$ his cat/pet$_{hyper}$")
- Crucial for term expansion and inference-based tasks

Approaches proposed in previous work:

- Purely supervised models based on thesauri, heuristics
- Pattern-based models that can leverage unlabelled data

Pattern-based Approach

(Schulte im Walde & Köper, 2013)



Data Sets

(collected by Scheible & Schulte im Walde; Benotto & Lenci; Yap & Baldwin, 2009)

- 692 German and 648 English word pairs

	synonymy	antonymy	hypernymy
Noun	stone–rock	defeat–victory	thumb–finger
Verb	try–attempt	export–import	scribe–write
Adj.	unclean–dirty	left–right	historic–old

- 9,478 English noun pairs (50% unrelated)

Related$_{syno}$	bend–turn	Unrelated	game–injury

Discourse Markers and Relations

(Marcu and Echihabi, 2003; Prasad et al., 2008; inter alia)

Motivation and Research Questions

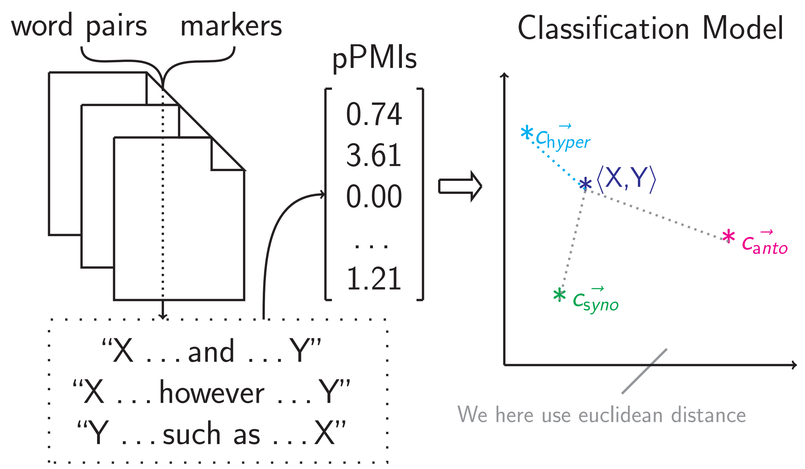
- Antonyms frequently indicate contrast relations
- Word pairs are generally good indicators for discourse relations

Can we apply these insight in reverse?
Do discourse relations also indicate lexical relations?

Markers as Proxies for Discourse Relations

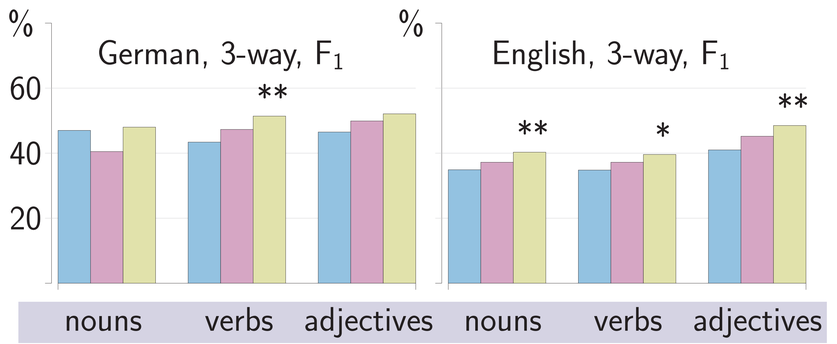
+ Exist in many different languages
+ Known to capture various semantic properties
+ Frequently found across genres
+ Definable as a small and fixed set

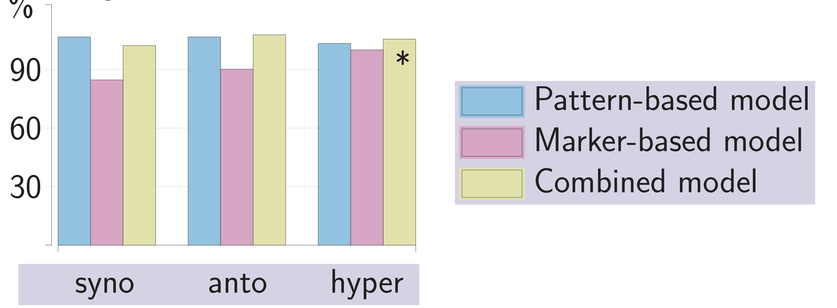
Model



- Discourse markers from PDTB, translated via `dict.cc`
- Intra-sentential co-occurrences triples: ⟨X, MARKER, Y⟩
- Allow for wild-cards between words and markers

Results





Conclusions

- Light-weight model: little memory and no parsing required
- Easily extendible to other languages (via translation)
- Higher recall and F_1-score than with >10,000 word patterns
- Complementary strengths, best results in combination

Acknowledgements

This research was funded by the DFG project "Distributional Approaches to Semantic Relatedness" and the DFG Heisenberg Fellowship SCHU-2580/1-1.