The Collection

Semantically related English word pairs, rated for the strength of the semantic relation holding between them

Part of a larger project, whose goal is to characterize paradigmatic relations cross-linguistically

- German: (Scheible and Schulte im Walde, 2014). IMS Stuttgart
- Italian: Computational Linguistics Lab, University of Pisa (collection ongoing)

paradigmatic relations: synonymy, antonymy, hypernymy  
3 parts of speech: nouns, verbs, adjectives 
degrees of relatedness

+ directionality

For every target/relation/relatum: triple, we collected forward and backward ratings (e.g., artist-synonym-painter vs. painter-synonym-artist)

Step 1: Generation Experiment

On Amazon Mechanical Turk, native speakers have been asked to generate related words for 99 English targets per part-of-speech

Random selection of targets from WordNet (Miller, 1995) with a stratified sampling technique (Scheibe and Schulte im Walde, 2014).

- polysemy class: I) one sense; II) two senses; III) >3 senses
- frequency classes: I) low (200–2,999); II) mid (3,000–9,999); III) high (>10,000)
- size of the WordNet semantic class

Experiment conducted by Giulia Benotto and Alessandro Lenci (Computational Linguistics Lab, University of Pisa).

References & Acknowledgments


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Step 2: Rating Experiment

Goal: find pairs for which a full target, weakly related, strongly related, not related: tuple was available. Criteria:

- at least 2 different relata had been generated
- a strongly related word (e.g., painter) was produced at least 4 times
- a weakly related word (e.g., creator) was produced twice or once
- a negatively related word was produced at least twice for the opposing relation: ANT for SYN and HYP, SYN for ANT (e.g., painter, antonym, scientist)

1,716 target/relation/relatum: triples, per each direction

Ratings collected with AMT:

✓ “Do you think that the following two words are synonyms?”
✓ 6 points scale (0-5)
✓ 10 workers per target/relation/relatum: triple, per each direction

The Resource

- Target, relation, relatum: some examples
- Noun, Adjective, Verb
- Degree: strong, weak, not related
- PoS: noun, adjective, verb
- Attr: degree, PoS
- Target, relation, relatum: rating

Further information available with the resource:

- Z-score transformed ratings
- Full data per subject (e.g., for linear mixed effect analysis)
- Work Time in Seconds from AMT. Future work: work time as RT

Case Study: Directionality

Are some relations/parts-of-speech more asymmetric than others?

Method: item-based prediction with linear regression models

Model 1: signed difference

Parameter | Value | p
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Relation | 1.53 | **
PoS | 1.49 | **
Degree | 0.35 |
Relation * Degree | 1.61 | **
Relation * PoS | 0.58 |
Degree * PoS | 0.66 |
Target | 16.82 |
Main effects & in, R² (23%)

Model 2: absolute difference

Parameter | Value | p
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Relation | 0.68 | 
PoS | 0.79 | 
Degree | 5.55 | ***
Relation * Degree | 0.94 |
Relation * PoS | 0.35 |
Degree * PoS | 0.11 |
Target | 21.29 |
Main effects & in, R² (20-17%)

HYP and VERBS are the most asymmetric → stronger asymmetry for WEAK pairs