Recap: output of the comparison

The individuals of the 2 knowledge graphs generated by the 2 sentences are connected through these predicates:

- **equivalent**: same lemma and at least 1 neighbour "in common"
- **synonymy**: synonym lemma and at least 1 neighbour "in common". *Example:*
  - *"...the **people** in a number of countries..."*
  - *"...the **populations** of some countries...".*
- **different**: different lemma and at least 2 neighbours "in common". *Example:*
  - *...the session of the European Parliament **adjourned** on Friday..."*
  - *"...the session of the European Parliament, which was **interrupted** on Friday...".*
- **differentContext**: same lemma and 0 neighbours "in common"

Then the elements not classified are marked with the predicate **onlyIn**.

Project Work extensions

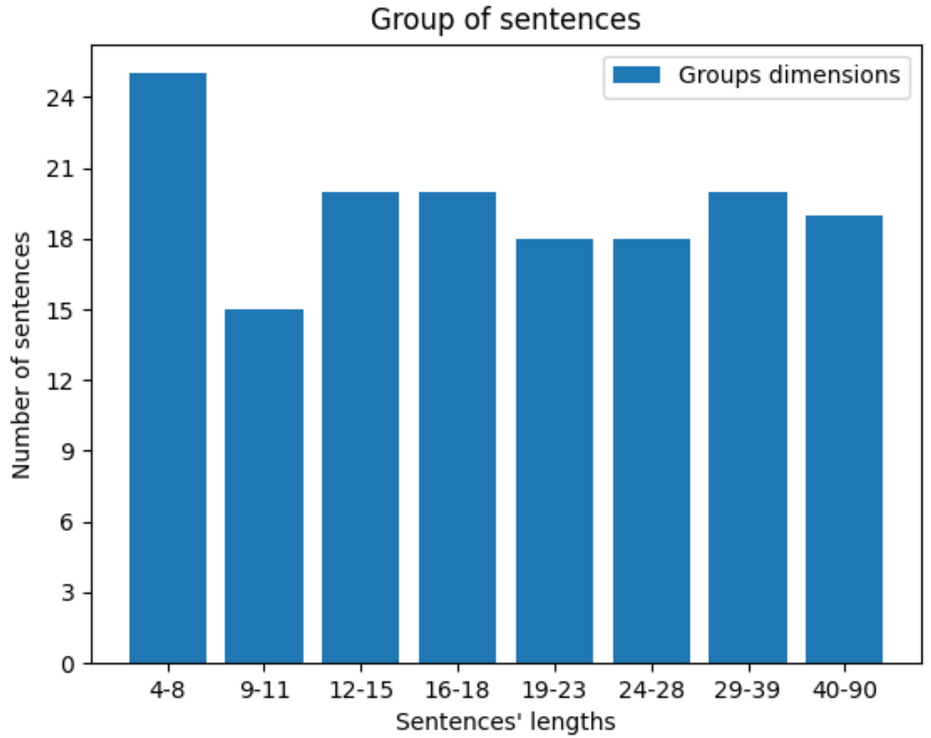
- **Translation** of English sentences from **Europarl** and **WikiNER dataset** with **DeepL** and **Argos Translate** to obtain different versions of them
- **Generation of the ontologies** using the API of **Fred**
- **Generation of the comparisons ontologies** with the procedures implemented in the project
- **Assessing the quality of the translation** with metrics constructed using the predicates we defined in the project
- **Plotting the results** with **matplotlib** to see weather and how the pivoting language and the sentences' length affect the quality of the translation

A bit of error analysis

- Not all synonyms are captured
- Errors when an expression in the initial version map into another one with different length. Examples:
  - **ensure => make sure**: ensure and make are marked as synonyms while sure is classified as something present only in the second sentence
  - **in fact => indeed**: "in" doesn't appear in the knowledge graph generated with Fred and "fact" and "indeed" are not classified
- Different relations issues:
  - "We then **put** it to a vote", "Then we **vote** on it".
  - "**There** has therefore been enough time for the Commission...", "So the Commission had enough **time** to...".

Comparison across translators

- 155 sentences from the English Europarl dataset



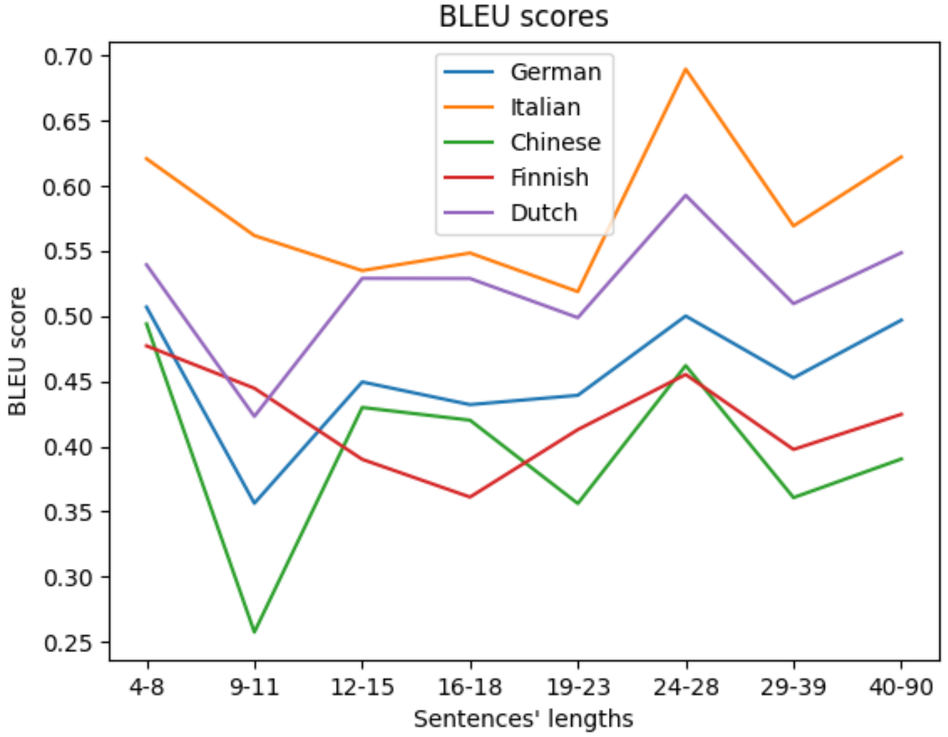
DeepL

Average BLEU scores:

IT = 0.584 NL = 0.524

DE = 0.458 FI = 0.421

ZH = 0.404



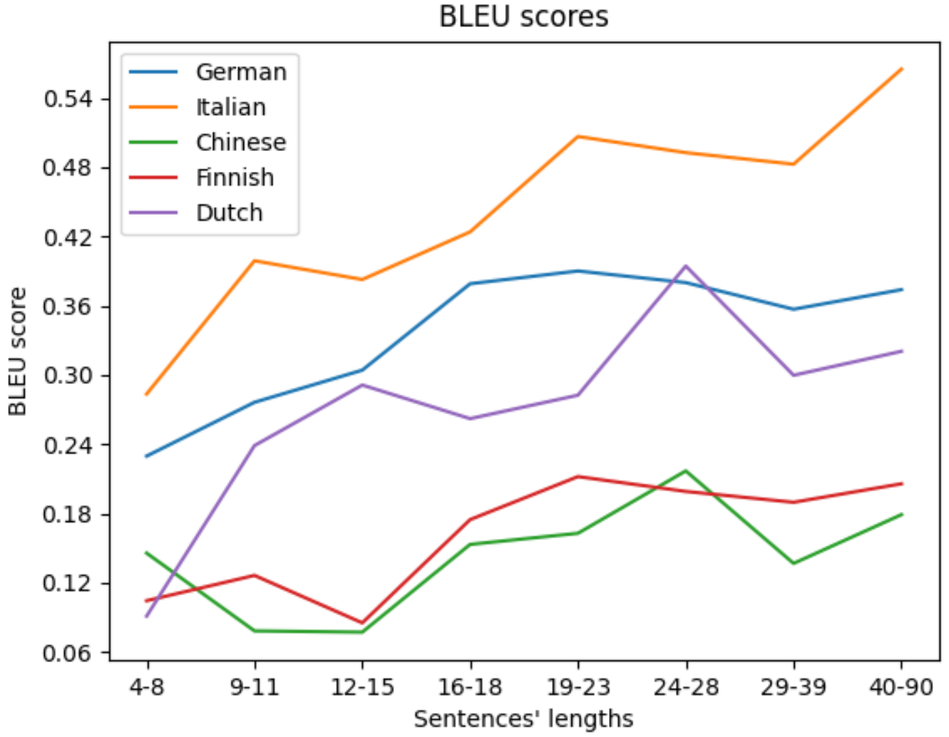
Argos Translate

Average BLEU scores:

IT = 0.436 DE = 0.333

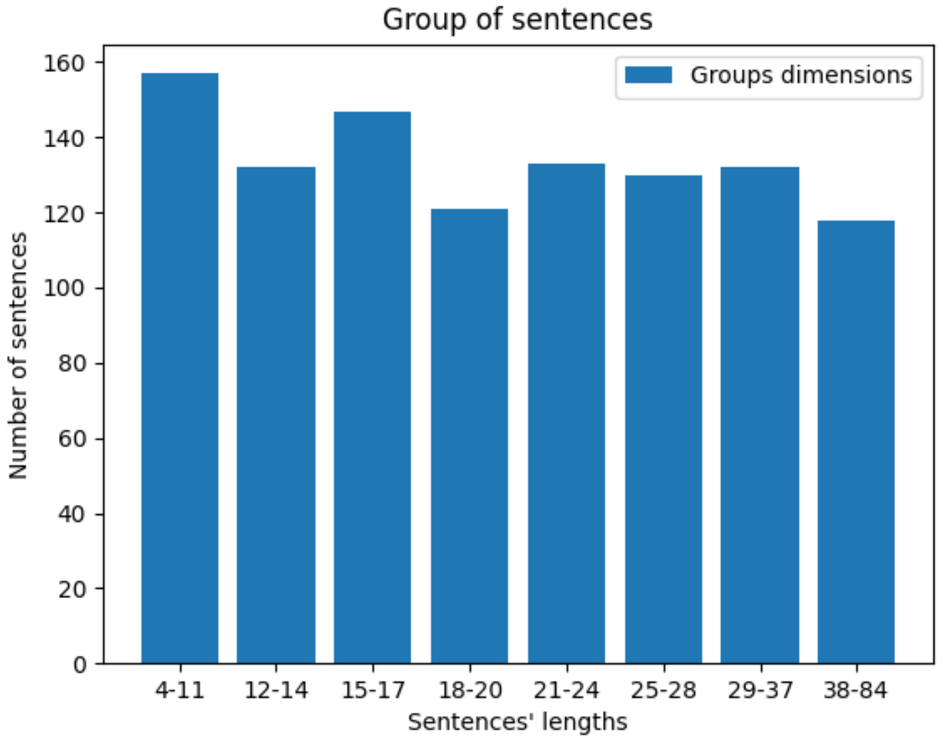
NL = 0.266 FI = 0.160

ZH = 0.145



Dataset

- 494 sentences from the English Europarl dataset
- 576 sentences from WikiNER dataset

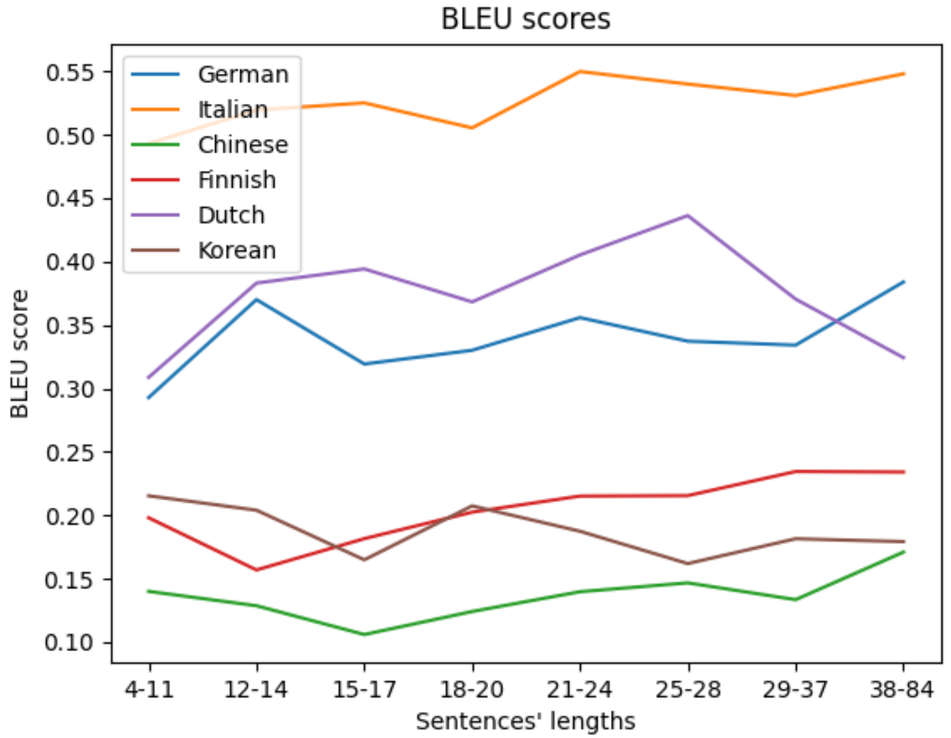


BLEU score: Europarl + WikiNER

Average:

IT = 0.525 NL = 0.373 DE = 0.338

FI = 0.204 KO = 0.188 ZH = 0.136



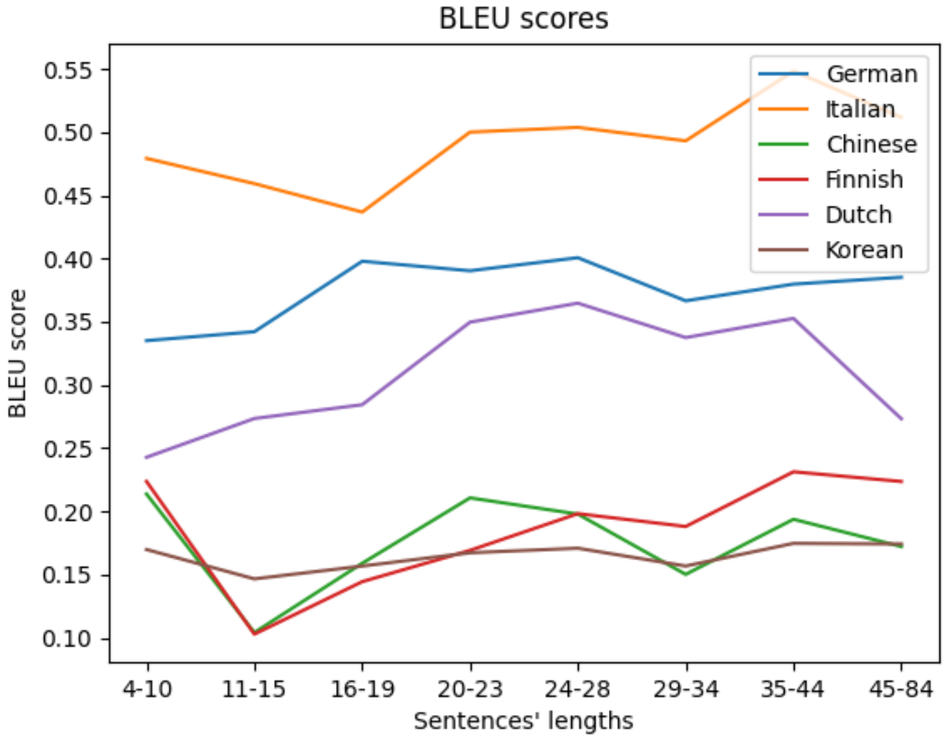
EuroParl

Average BLEU scores:

IT = 0.490 DE = 0.375

NL = 0.308 FI = 0.184

ZH = 0.175 KO = 0.164



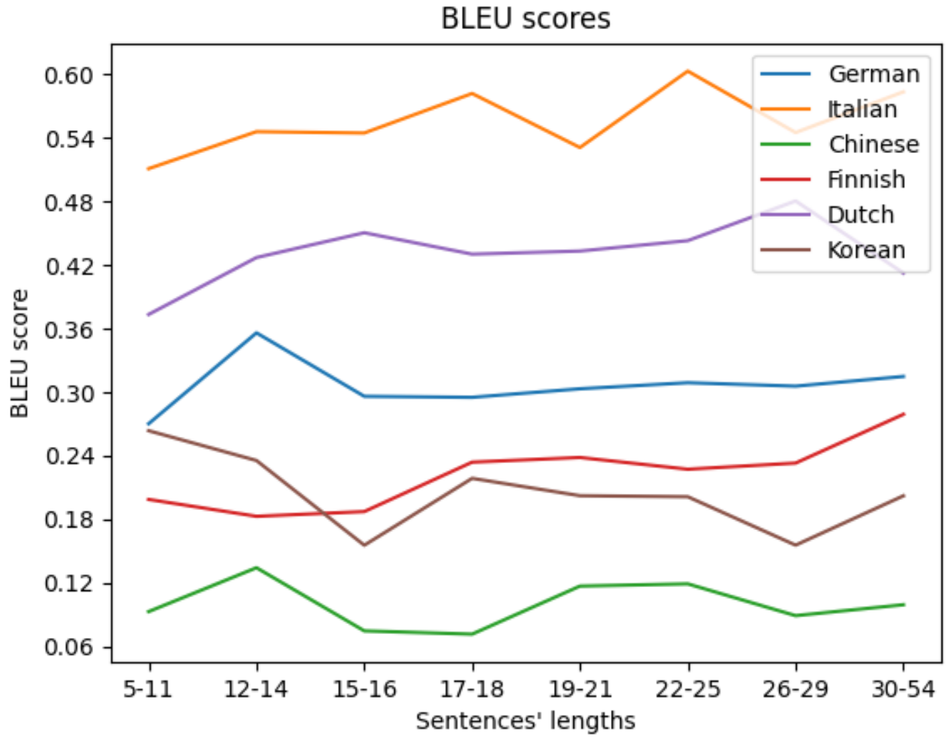
WikiNER

Average BLEU scores:

IT = 0.556 NL = 0.429

DE = 0.307 FI = 0.221

KO = 0.208 ZH = 0.102

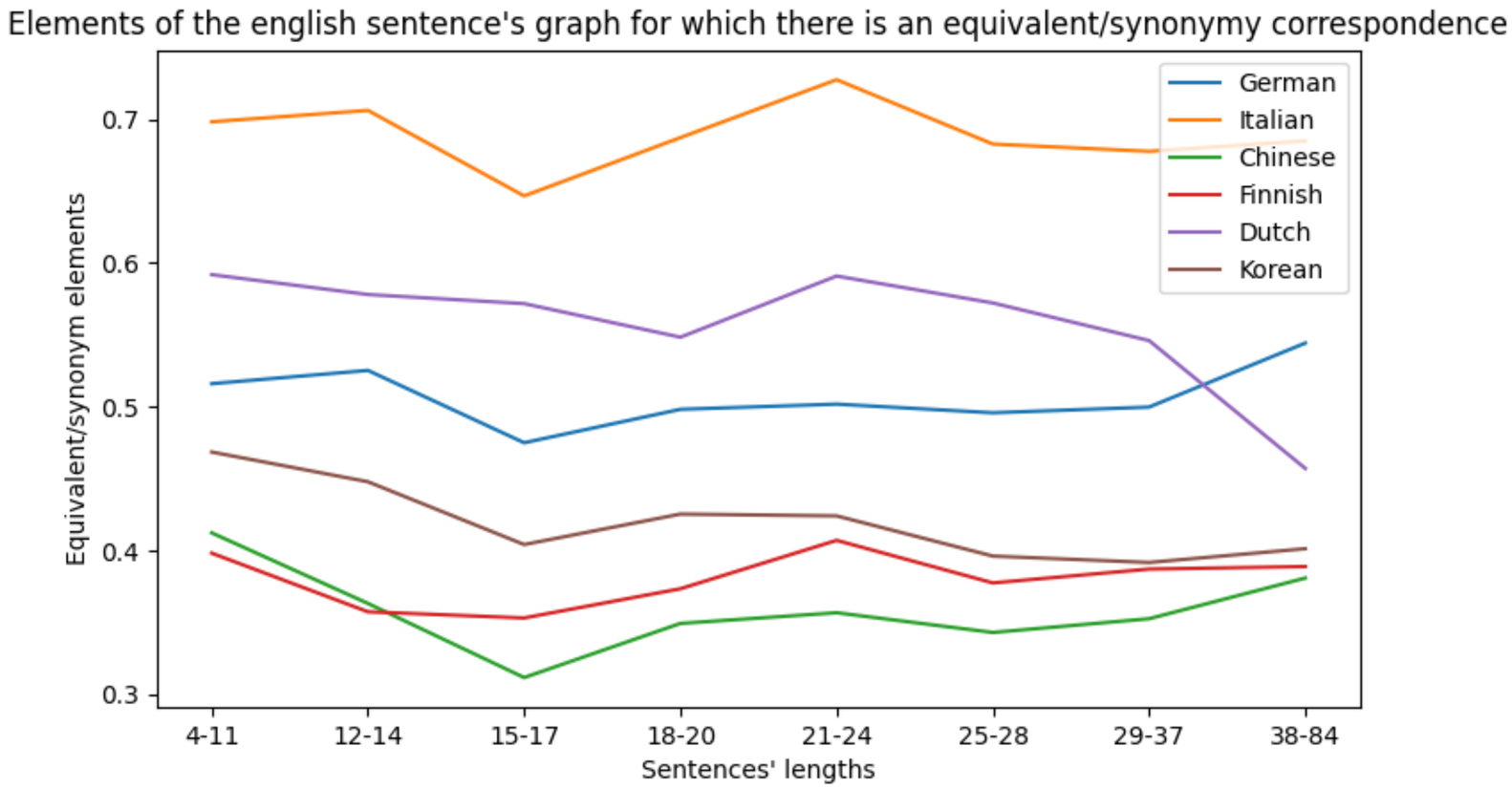


Equivalent/synonymy metric: EuroParl + WikiNER

Average:

1) IT = 0.689 2) NL = 0.560 3) DE = 0.506

4) FI = 0.380 5) KO = 0.421 6) ZH = 0.359



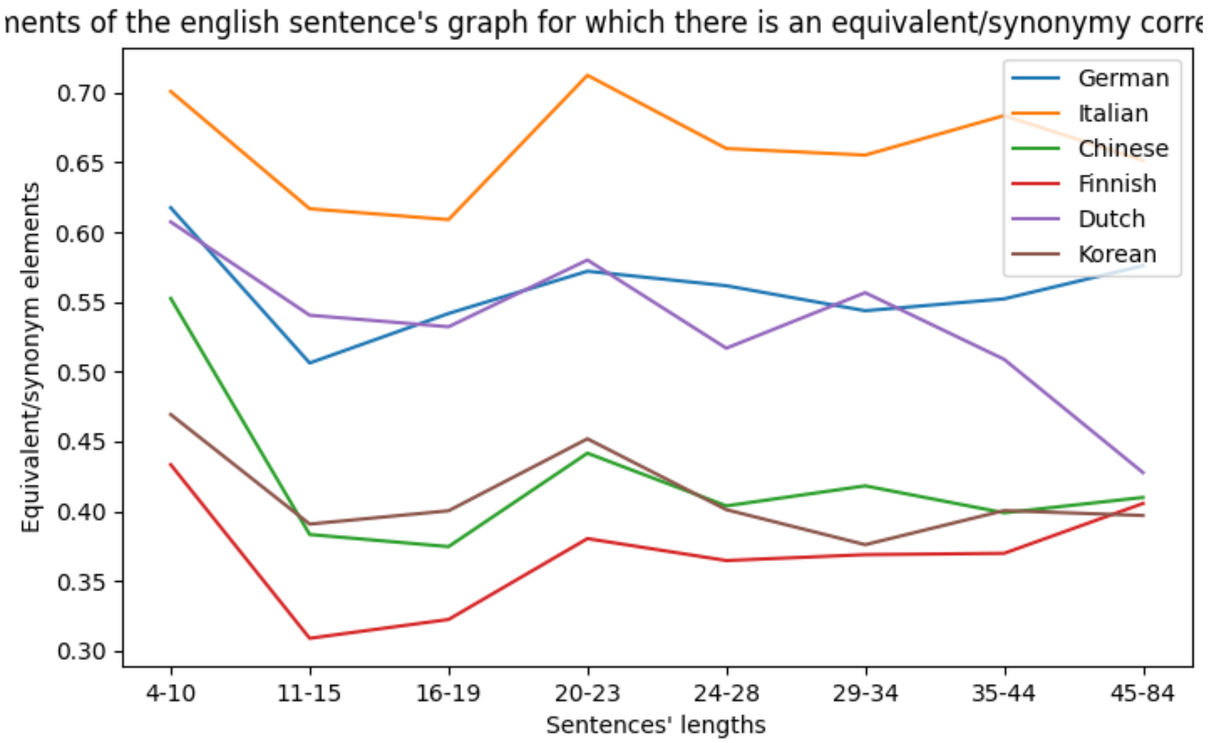
EuroParl

Average equivalent/synonymy metric:

1) IT = 0.659 2) DE = 0.558

3) NL = 0.533 4) ZH = 0.422

5) KO = 0.411 6) FI = 0.368



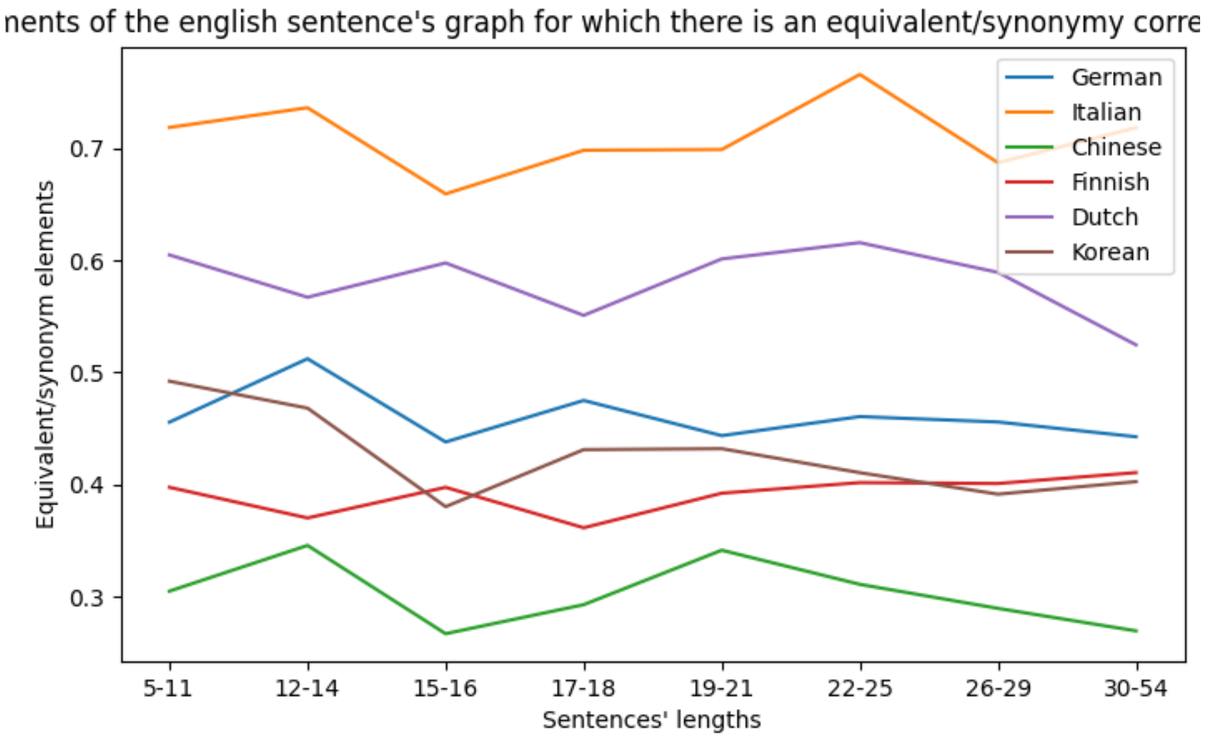
WikiNER

Average equivalent/synonymy metric:

1) IT = 0.714 2) NL = 0.582

3) DE = 0.462 4) KO = 0.430

5) FI = 0.391 6) ZH = 0.306

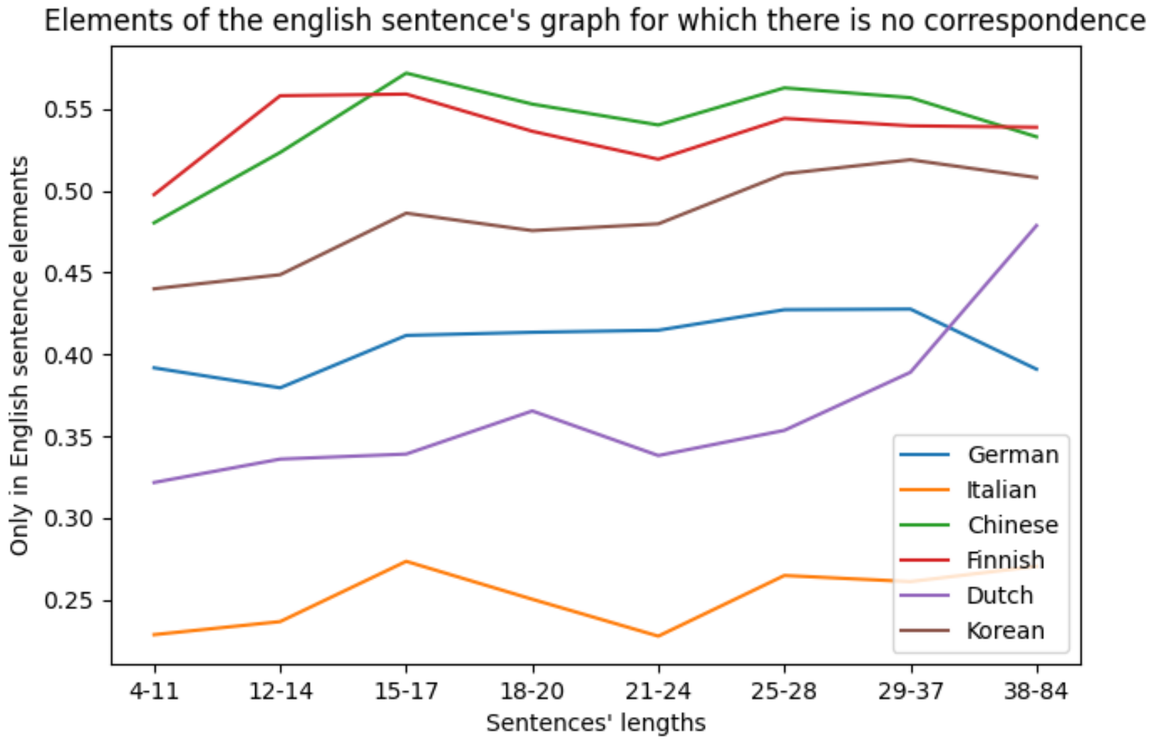


OnlyIn metric: EuroParl + WikiNER

Average:

1) IT = 0.251 2) DE = 0.407 3) NL = 0.362

4) KO = 0.482 5) FI = 0.536 6) ZH = 0.539



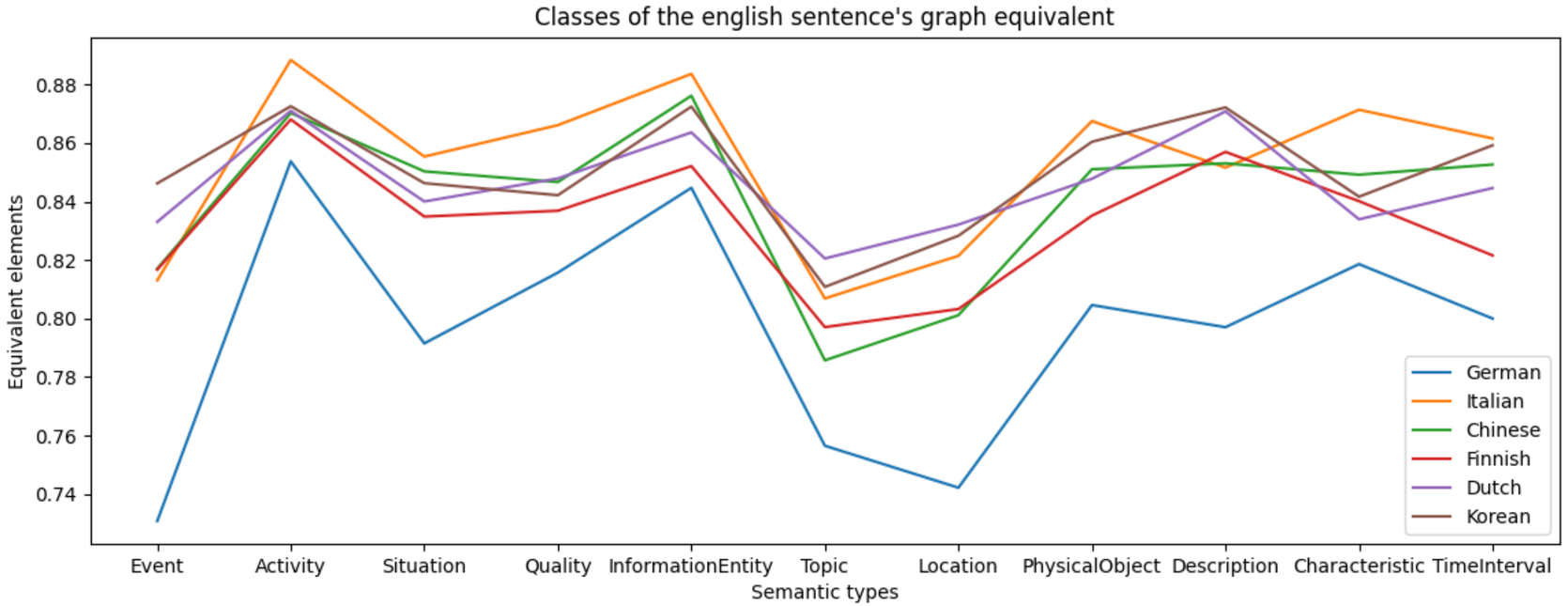
Semantic types analysis

1. Extraction of all the elements with one of these prefix:
    a. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#
    b. http://www.ontologydesignpatterns.org/ont/d0.owl#
    c. http://schema.org/
2. Extraction of all the subclasses of the elements retrieved at step 1
3. Selection of the triples in the comparison graphs involving the classes retrieved at step 2.

Semantic types analysis

1. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#Event
2. http://www.ontologydesignpatterns.org/ont/d0.owl#Activity
3. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#Situation
4. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#Quality
5. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#InformationEntity
6. http://www.ontologydesignpatterns.org/ont/d0.owl#Topic
7. http://www.ontologydesignpatterns.org/ont/d0.owl#Location
8. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#PhysicalObject
9. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#Description
10. http://www.ontologydesignpatterns.org/ont/d0.owl#Characteristic
11. http://www.ontologydesignpatterns.org/ont/dul/DUL.owl#TimeInterval

Semantic types analysis: equivalent/synonymy metric



Semantic types analysis: equivalent metric