Although the Germanic and Romance language share most of their tense systems, there is still variation in tense use, especially in the Perfect tense. We use a parallel corpus approach to uncover these differences: translations provide us with form variation while meaning stays stable. We present a novel methodology to annotate and visualize tense variation. We apply this methodology to translations of J.K. Rowling’s Harry Potter and the Philosopher’s Stone in six languages from two language families (Germanic (English, German and Dutch) and Romance (Spanish, French and Italian)). While we find almost no variation in tense use in the narrative parts of this novel, we do find variation in the dialogues. We find a core Perfect shared by all languages under investigation, but also competition between Present, Perfect and Past.

**Analysis: core Perfect**

We find that there is a core Perfect meaning shared by the languages under investigation. We classify these cases as follows:

1. **States** that have lasted for a while, but are now over.
   a. ‘You’ve had nearly fifteen minutes, now OUT,’ she said.
   b. ‘We’ve had precious little to celebrate for eleven years.’
2. **Events that yield a result state with current relevance.**
   a. ‘See what I have become?’, the face said.
   b. ‘I’ve won the House Cup for Gryffindor.’
3. **Negative existential phrases** absence of an event that would have had current relevance.
   a. ‘EtPetunia, dear, you haven’t heard from your sister lately, have you?’
   b. ‘I haven’t flushed so much since Madam Pomfrey told me she liked my new earmuffs.’

**Analysis: Perfect vs. Past**

From the MDS analyses, we see that there is a Perfect introduced frequently in English simple past cases. We categorize these as follows:

1. **Narrative sequences** in French, Italian and German. Note that in (1c), Dutch does allow a Perfect at the start of the narrative sequence.
   a. ‘I killed your father first and he put up a courageous fight...’
   b. ‘T’ai d’abord taître prie et il m’a résisté avec une grande hargneur...’
   c. ‘Ik heb eerst je vader gedood en de weerweerdich slop...’
2. **Perfective past events in English, Italian and German.**
   a. ‘I think he sort of wanted to give me a chance!’
   b. ‘Pense-joa abbia voltato darmi una possibilità...’
   c. ‘Ich glaubte, er wollte mir eine Chance geben...’
3. **Perfect events** that result in a resulting state with no direct current relevance in French, Italian, German and Dutch. See also (1) for a similar context.
   a. ‘Dumbledore gave me the day off yesterday for it.’
   b. ‘Dumbledore me dio libbre el día de ayer para hacerlo...’
   c. ‘PERKAMENTUS heb me eitren vīdēt gegeven on’t te regen...’

We do not find competition between Perfect and Imperfect: Germanic languages all consistently opt for a Past tense in these cases.

**Analysis: Perfect vs. Present**

We find that Perfect use in English is more present-oriented. In two categories of cases, other languages require a Present:

1. **States that continue into the present.**
   a. ‘How long have I been in here?’
   b. ‘¿Cuánto tiempo hace que estoy aquí?’
   c. ‘We lange lang in schok zijn kwier...’
2. **Resumptives with to get. In some cases, Spanish also allows a Perfect here.**
   a. ‘I’ve got you a present.’
   b. ‘Te he traido un regalo.’
   c. ‘Ich hab ein Geschenk für dich.’

**Conclusion**

We have found that there is almost no variation in tense use in narrative parts of the novel. In the dialogues, the main source of variation in tense use is the Perfect. The Perfect has a core meaning shared by all languages, but is also in competition with the Past and the Present. In the languages under consideration, we find four configurations, categorized below:

<table>
<thead>
<tr>
<th></th>
<th>narrative past</th>
<th>completed ev.</th>
<th>core Perfect</th>
<th>resumptive</th>
<th>continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>French, German</td>
<td>Italian</td>
<td>Spanish</td>
<td>English</td>
<td></td>
</tr>
</tbody>
</table>

The Rosetta Stone proved to be the key to deciphering Egyptian hieroglyphs. We think parallel corpora might be its contemporary in discovering variational patterns between languages. In contrast to popular black-box methods, multidimensional scaling allows for combining distant and close reading, which we think could move both linguists and the digital humanities as a whole forward.

**Methodology**

Our data stems from J.K. Rowling’s Harry Potter and the Philosopher’s Stone, chapters 1 and 17. The novel and its translations were OCR-ed, manually checked for spelling errors and then automatically preprocessed and aligned (software used: Eypo Hodgson, 2003). We created a script to mark dialogue and narrative parts based on punctuation. Annotators then selected all finite, indicative verb phrases from the corpus and assigned a tense label to these verb phrases in a web interface (dubbed PreSelect). Annotators then marked the translations for each of these verb phrases in German, Spanish, French, Italian and Dutch and assigned tense labels (dubbed TimeMaps, van der Kna et al. (2017)). As an example:

1. a. ‘But Snape tried to kill me!’ [en, Perfect]
2. a. ‘Alber Snape hat versucht mich umzubringen!’ [de, Perfect]
3. a. ‘Put Snake tráblo de matarme!’ [es, Perfect]
4. a. ‘Moe Rogn a essa原理 de me matar!’ [it, Perfect]
5. a. ‘Ma Piten ha tentato di uccidermi!’ [nl, Perfect]
6. a. ‘Maar Snuff heeft geprobeerd me te vermoorden!’ [nl, Perfect]

**Descriptive statistics**

We see almost no variation in the narrative parts, the main difference is that the Romance languages share an Imperfect that is used instead of the Past in some cases.

**Visualization using multidimensional scaling**

We can further analyse the competition in the Perfect domain if we focus on translations of the English simple past cases. We use multidimensional scaling (MDS) to uncover patterns in translation (after Witzel & Cysouw, 2012). MDS allows us to visualize the level of similarity of contexts in the dataset. We define a context as a tuple of assigned tense labels (e.g. (1) = [Past, Perfect, Past, Past, Perfect, Perfect]). Two contexts are considered most similar if the tense label for each language matches.

In the dialogues, the Present and Future domains are largely similar across languages. The main competition is between the Past, Present and Imperfect with all languages (except for Spanish) using far more Perfects than English. We see that the French and Italian Past is almost non-existent.

**Table 1: Most frequently attributed tense categories in the dialogue part of the novel**

<table>
<thead>
<tr>
<th>Language</th>
<th>Present</th>
<th>Past</th>
<th>Imperfect</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>en</td>
<td>6 6 4 6</td>
<td>6 6 5</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>fr</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>it</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>nl</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

**Table 2: Most frequently attributed tense categories in the narrative part of the novel**

<table>
<thead>
<tr>
<th>Language</th>
<th>Present</th>
<th>Past</th>
<th>Imperfect</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>en</td>
<td>126 122 120 123 162</td>
<td>80 100 99</td>
<td>20 75 50 78 79</td>
<td>20 75 50 78 79</td>
</tr>
<tr>
<td>fr</td>
<td>27 21 20 100 50</td>
<td>100 40</td>
<td>120 64 88 88 88</td>
<td>120 64 88 88 88</td>
</tr>
<tr>
<td>it</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>nl</td>
<td>20 15 11 23 39</td>
<td>20 15 11 23 39</td>
<td>20 15 11 23 39</td>
<td>20 15 11 23 39</td>
</tr>
</tbody>
</table>

**Fig. 1: Result from applying MDS, same as in Fig. 1, but now with Dutch tense labeling**

**Fig. 2: Result from applying MDS, same as in Fig. 1, but now with Dutch tense labeling**

**Fig. 3: Result from applying MDS, same as in Fig. 1, but now with French tense labeling**

**Fig. 4: Result from applying MDS, same as in Fig. 1, but now with German tense labeling**

**Fig. 5: Result from applying MDS, same as in Fig. 1, but now with Italian tense labeling**

**Fig. 6: Result from applying MDS, same as in Fig. 1, but now with Spanish tense labeling**

**Fig. 7: Result from applying MDS, same as in Fig. 1, but now with French tense labeling**

**Fig. 8: Result from applying MDS, same as in Fig. 1, but now with Dutch tense labeling**

**Fig. 9: Result from applying MDS, same as in Fig. 1, but now with German tense labeling**

**Fig. 10: Result from applying MDS, same as in Fig. 1, but now with Italian tense labeling**

**Fig. 11: Result from applying MDS, same as in Fig. 1, but now with Spanish tense labeling**