In this resource, you can follow a step-by-step description of a research data workflow involving the annotation of multilingual parliamentary corpora (French, German, British) according to the guidelines of the Text Encoding Initiative (TEI). Read further if you are interested in working with the TEI, analyzing parliamentary corpora, or simply would like to see a validated example of how FAIR and open data is implemented in the context of a PhD dissertation in Corpus Linguistics.
How to read this document

This document is the first instance of the research data workflow series provided by the DARIAH Research Data Management Working Group. As research is becoming increasingly digital and data-driven, there is a growing pressure on researchers and research teams to find ways to enable technological and cultural compliance with European-level and national data policies. Research data management emerged to be a new field of expertise to explore and establish in all range of disciplines. Clearly, the generic research data management guidelines do not always align well with the cultural, conceptual and epistemological complexity of research data in the arts and humanities.

Who are we?

As members of the DARIAH Research Data Management Working Group coordinated by Erzsébet Tóth-Czifra and Marta Błaszczyńska, we believe that data management practices work best if they are firmly grounded in actual research realities. Therefore, through the publication of a series of data workflows that summarize experiences and know-hows from concrete research projects, our aim is to open the black box of data curation on very specific levels and to provide inspiration to fellow scholars who are working within the same discipline and/or data type.

For whom is this document?

The target audience of this document are all researchers who are potential reusers of part of the data and the workflow summarized below. This includes those who are working with TEI annotations or are interested in working with them, as well as those who work or aim to work with parliamentary corpora.

The document is not to be read as a best practice in the sense of ‘these are the solutions you need to follow under any circumstances’, but rather as a concrete application of how to implement reflections on Open Science when gathering and collecting your data, no matter for which purpose and where you come from.

When she began her PhD, Naomi Truan, whose completed project is here presented, had a background in German studies with a focus on the qualitative analysis of texts and no background on neither Digital Humanities (the use of digital tools in humanities), nor on Open Science (the practice of sharing not only one’s research findings, but also one’s data, for instance).

This Research Data Management Workflow shows that the implementation of reproducible, standardized, and open data practices is accessible to anyone.
Overview

What?
Creating and analyzing multilingual parliamentary corpora

Who?
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Methods
A contrastive, corpus-based linguistic study of French, German and British parliamentary corpora. Analysis is conducted through a TEI annotation (Text Encoding Initiative) scheme that offers a standardized, still flexible framework that is suitable for the contrastive focus of the study. This includes annotating both elements within the text and the metadata associated with it. The analysis is then conducted both qualitatively and quantitatively, notably by using the open-source software TXM.

Project
PhD dissertation (Truan 2018) and the resulting book (Truan 2021) as well as several related papers, all available in open access on the HAL-SHS open repository of the author. No funding for the annotation framework specifically. The work has been carried out by a single person as part of a PhD project.

Key values
small-scale, well-documented, open and reproducible workflow, rich reuse history, Open Science in practice, Research Data Management decisions are inherent part of the design and analysis

Keywords
corpus linguistics, contrastive analysis, parliamentary debates, Text Encoding Initiative (TEI), linguistic annotation, discourse analysis, XML mark-up
Workflow

Creating and analyzing multilingual parliamentary corpora

In the following pages, we detail the six steps by including excerpts of an interview of Naomi Truan conducted by Erzsébet Tóth-Czifra and Marta Błaszczyńska on 07.10.2020 as well as references and useful resources in boxes.

Step 1: Selection of the data relevant to the research question

To enable the cross-linguistic analysis of third-person reference based on empirical data, British, French, and German parliamentary debates are gathered for a contrastive corpus study. To ensure the comparability of the three national contexts, the selection was restricted to national debates revolving around the European Council meetings.

The analysis was limited to the official transcripts of parliamentary records; audio and video resources were consulted on a qualitative basis only.

“I did not engage with audio and video data extensively, which I could have, but chose not to because I did not need it for my aims. I was indeed working mostly in semantics and pragmatics and did not include multimodal elements into the analysis. If it had to be included, it would have been a whole different story because then you would have to add the time stamp to the XML-TEI annotation, etc.”
All the texts have been retrieved from the official websites of the respective parliaments where the transcripts are shared as public data.

**Resources:**
- [http://hansard.parliament.uk/](http://hansard.parliament.uk/) for the House of Commons (HTML)
- [http://pdok.bundestag.de/](http://pdok.bundestag.de/) for the German Bundestag (PDF)

**Step 2: Harmonization of the sub-corpora**

“[At the time of my first investigations, in 2014-2015, both the British House of Commons and the French Assemblée nationale displayed the parliamentary proceedings in HTML, which allows for a quick, easy, and accurate retrieval of the content. The German corpus, on the other hand, was based on PDF files. PDF files are noticeably less adequate for further encoding and tagging. In this case, the files have sometimes suffered from inadequate word breaks, thus necessitating minor corrections. I carried out the encoding process into the TEI Guidelines by combining manual and automatic processing workflows, with the idea of keeping both the content and the metadata of the sources.”

Source materials have been converted into a TEI-XML format with the help of the GROBID suite:
- TEI stands for Text Encoding Initiative, a community of digital humanists who collectively define a type of XML format.
- XML stands for Extensible Markup Language, a markup language that defines encoding standards for documents in formats that are both human-readable and machine-readable.

“In particular, we used the GROBID software suite, which provides a relatively efficient transformation process from PDFs to a decent TEI format, although not fully compliant with the target encoding scheme. Attention was given to unifying the final format across the three languages and parliamentary settings so that the same phenomena and features would be encoded exactly in the same way for each sub-corpus.”

**Resources:**
GROBID software suite: [https://github.com/kermitt2/grobid](https://github.com/kermitt2/grobid).
Romary, Laurent & Patrice Lopez. 2015. GROBID - Information Extraction from Scientific Publications. ERCIM, Data Sharing and Re-Use. [https://hal.inria.fr/hal-01673305/document](https://hal.inria.fr/hal-01673305/document).
Step 3: Creation of the TEI annotation framework

Text Encoding Initiative annotation framework enables two levels: the TEI Header (metadata) and the text level (utterances, quotes). The part-of-speech tagging allowing for CQP queries was automated and directly integrated into the open-source TXM software.

CQP stands for Corpus Query Processor, a project developed within the IMS Open Corpus Workbench (CWB). As indicated on the website, “The IMS Open Corpus Workbench (CWB) is a collection of open-source tools for managing and querying large text corpora (ranging from 10 million to 2 billion words) with linguistic annotations. Its central component is the flexible and efficient query processor CQP”.¹

The integration of CQP for specific linguistic queries and TEI as a general annotation framework for digital texts is specific to linguistics, but the questions it raises are central to all Digital Humanities fields.

“I carried out the encoding process into the TEI Guidelines by combining manual and automatic processing workflows, with the idea of keeping both the content and the metadata of the sources.”

Why use TEI standards?

- The TEI builds on and fosters established, well-documented community standards that are widely acknowledged in the author’s field of study and above: corpus-based linguistic modelling and analysis.
- The TEI is flexible enough to allow for customized and easy-to-enrich annotations that are tailored to a specific research question (by contrast to ad hoc solutions such as a specific metadata schema for parliamentary debates).
- The thorough documentation of the decisions made to construct the annotation framework and its publication comes with the degree of scholarly transparency that enables reproducibility and reusability of the framework for other research settings and/or purposes.

Resources:

Step 3.1: Setting the scene

The TEI header places emphasis on identifying speakers in a way that is most appropriate and flexible for the sake of analysis (e.g. enabling the stable identification of speakers even if their political affiliation changes over the years). See p. 15 here.

Step 3.2: Encoding the content

The body of the XML-TEI corpora went through an automated, language-specific part-of-speech tagging with the help of Tree Tagger part-of-speech annotation tool directly integrated into the external open-source software TXM. You can follow the documentation of the import process and visualize the corpus through an XSL style sheet and an XML stylesheet here.

Output: .csv tables that were exported from the software TXM according to some specific queries / CQP requests (e.g. concordance lists and collocations with personal pronouns or nouns and nominal expressions).

One of the challenges was that the XML-TEI annotation was not as easily imported into the TXM software as we thought, which required email exchanges with the TXM team.

“We actually needed at least half a year, if not a whole year, to get TXM to recognize the TEI annotation. To make it work through the software, so to say. And for me, this was the most important thing, because I had had annotated my data set for quite a long time and knew that I wanted to work with the software TXM. But it didn’t match. This is also why I worked a lot qualitatively—in the meantime, before we figured out how the corpus could be imported. I actually began working with the data by extracting examples directly from the TEI-XML files. But it’s not the real workflow. I was waiting for someone to build the bridge.”

Another challenge was that we wanted to optimize heterogeneous data for contrastive reuse. The three sub-corpora were available in different formats and offered different possibilities for coding. Naomi had to find a common denominator, a unified annotation framework that works equally well for all three of them but is also suitable for contrastive analysis. This comes with limitations in terms of richness of the annotation for those who wish to reuse only one sub-corpus, for instance, working only on the French one.

Resources:
Step 4: Quality assurance and import into TXM

Due to the relatively small size of the corpus and the qualitative nature of the analysis, quality assurance consisted of manual checks of the encoding performed in an iterative fashion. Also, since the analysis had been carried out as Naomi’s PhD, there was no possibility of employing an assistant as co-annotator. As a next step, the TXM team provided support during the import of manual codes to TXM.

“And since the corpus was rather small and I felt like engaging with the data was part of my job anyways, I actually did everything by myself. I listened to a lot of podcasts [during the manual coding and the successive imports into TXM]. It was a great time, but it was not automatic at all.”

Step 5: Data sharing and publication

Parallel to the development of the annotation framework, and before the publication of any paper making use of the annotated corpora, Naomi opted for the publication of the annotated corpora in Open Access. Her main motivations were scholarly transparency and reproducibility. In order to allow other scholars to trace and eventually reproduce the analysis, or parts of it, as it unfolded, Naomi shared a rich documentation of the outputs and throughput.

The corpora and the annotation framework are deposited in the ORTOLANG repository because:

- ORTOLANG is specifically designed for linguistic data with the possibility to attach several linguistic descriptors (language, genre, source type, etc.).
- As a complementary service to Huma-Num (very large research infrastructure), ORTOLANG exhibits standards of a trustable repository: long-term archiving, permanent identifiers (PIIDs), version control, Creative Commons open licensing framework, precise identification of the various contributors to a resource.

The deposits contain:

1. The XML files annotated according to the guidelines of the Text Encoding Initiative (TEI).
2. The German corpus also includes the original PDF files of the transcriptions. For the other two corpora, a link is provided to the transcripts openly available in HTML format.
3. Documents providing 1) an overview of the debates being part of the corpora; 2) a generic and specific description of the annotation framework.

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The publication of the corpus is interlinked with research papers and complemented with additional documentation in the form of blog posts (see “Resources”).
### What kind of data? | What kind of platform?
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**Raw data**<br>Choose a license (as open as possible)! **Open Access Repository**<br>In Linguistics, see ORTOLANG (Open Resources and TOols for LANGuage), [https://www.ortolang.fr/](https://www.ortolang.fr/)
**Annotated Data**<br>Choose a license!<br>Explain how and why (= to which purpose, with which research question in mind) the data has been annotated<br>Attribution: cite the names of all people involved **Open Access Repository**<br>Not on a private platform (blog)<br>Your data needs to be archived with key words and easily available to the academic community

- Do it as soon as possible to ensure recognition and authorship
- Don't be afraid that anyone will 'steal' anything: the likelihood that someone else will have the same research question(s) on the same corpus is extremely low...
- It is more likely that you will develop cooperation projects!

### Resources:
Truan, Naomi. 2019. How to make the most of your publications in the humanities?” in the hands on session “Do-it-yourself Self-archiving”. [Presentation slides]. [https://www.fosteropenscience.eu/node/2605](https://www.fosteropenscience.eu/node/2605)
Step 6: Reuse

A rich reuse history is already available and presumably, the reuse cases Naomi is aware of are only fractions of the real reuse instances. Typical reusers are fellow scholars working on parliamentary debates, with disciplines ranging from linguistics to political sciences and sociology.

Citations of the corpora in research projects reusing them


“And for instance, the fact that my corpus or my corpora have been downloaded 100 times and have been used for several different projects, although the corpus annotation did not go through a peer-review process at the time fit has in the meantime, shows me that this is valuable and that my standards actually are used and useful to the community.”

A reuse challenge: proper citation is sometimes missing from reuse cases even if there is a ‘Cite as’ snippet prominently displayed on the landing pages of the deposits. In order to cite data properly, have a look at these recommendations:

Resources:
Andreasen, Helene N., Andrea L. Berez-Kroeker, Laura Collister, Philipp Conzett, Christopher Cox,
To conclude

To conclude, and also because in this data story, we aimed to initiate an honest discussion about data workflows and openness, it is worth highlighting that opening a bigger window on one’s scholarly processes means a significant amount of investment, not only in terms of time and effort but also ethically and even emotionally. Working with sharing in mind from the beginning involves being ready to be exposed. As Naomi puts it:

“You have to feel ready to be exposed and to feel like vulnerability is part of your research. And for me, it has been amazing because I think sharing my data has opened a lot of new things. Now I am working more qualitatively as well, practicing autoethnography, and basically involving what research does to you. So I think that [opening my workflow and publishing my annotated corpora] has been very helpful. But it is hard. It is really hard because people do not always value it the way you would want them to.”

Still, what is also clear from Naomi’s words is that sharing your data is feasible within the timeframe of a PhD project. Each of these windows, each of these open documentation components can create rich ways of engagement with the work and can thus advance one’s career and position in the field. We hope that this document has shown you in a practical way the possible impacts of working on your project with sharing in mind.

References

Annotated corpora and annotation framework

https://hdl.handle.net/11403/uk-parl.
https://hdl.handle.net/11403/fr-parl.
https://hdl.handle.net/11403/de-parl.

Paper describing the TEI annotation framework


The paper has been written with reusability considerations in mind: “Making decisions explicit, transparent, and replicable are primary prerequisites for doing science in the digital age.”

Key publications


Softwares

Romary, Laurent & Patrice Lopez. 2015. GROBID - Information Extraction from Scientific Publications. ERCIM, Data Sharing and Re-Use. https://hal.inria.fr/hal-01673305/document.
Blog posts


Glossary

CQP

CQP stands for Corpus Query Processor, a project developed within the IMS Open Corpus Workbench (CWB). As indicated on the website, “The IMS Open Corpus Workbench (CWB) is a collection of open-source tools for managing and querying large text corpora (ranging from 10 million to 2 billion words) with linguistic annotations. Its central component is the flexible and efficient query processor CQP”.

TEI

TEI stands for Text Encoding Initiative: comprising a set of community practices (as well as the communities themselves) to mark-up and encode textual scholarship in a collectively defined a type of XML format. For the official definition, see also: https://tei-c.org/release/doc/tei-p5-doc/en/html/SG.html (accessed on 31.08.2021).

TXM

TXM is an open source research analysis software that had been developed within the framework of the French Textométrie project and is designed to perform a new generation of textometrical research, in synergy with existing corpus technologies (Unicode, XML, TEI, NLP tools, CQP, R). You can learn more about the software here: http://textometrie.ens-lyon.fr/?lang=en (accessed on 31.08.2021).

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XML

XML stands for Extensible Markup Language, a syntax used for defining mark-up languages for encoding documents in standardized formats that are both readable by humans and machines. For a commonly agreed definition, see also: https://en.wikipedia.org/wiki/XML (accessed on 31.08.2021).