MorArgAn: Moral Argument Analytics – Quick start Guide

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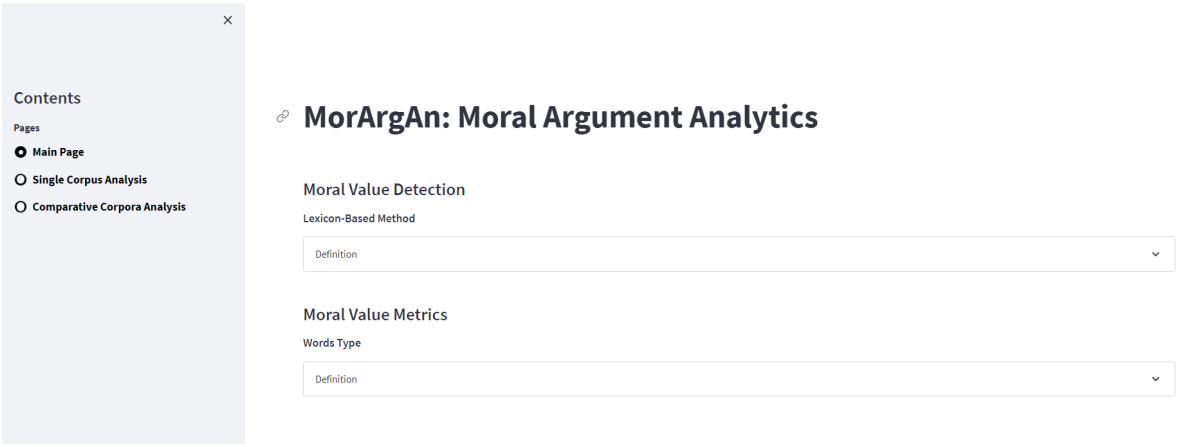


Introduction

This manual is crafted to guide you through the basic operations of the MoralArgAn Interface. Diving into its core, MoralArgAn (Moral value analysis in argumentation), as an AI-based argument technology, is designed to systematically evaluate the moral underpinnings within an argumentative discourse. By detecting moral foundation words and analysing the corresponding moral values in the content and structure of arguments, this technology aims to understand the inherent moral values shaping the argumentation.

The development of this interface is intricately linked to the findings and methodologies presented in a paper showcased in VALE workshop: Detection and Analysis of Moral Values in Argumentation.

If you encounter any challenges or have more intricate queries as you navigate through this interface, we are here to assist. Please do not hesitate to reach out to our support team at zhanghe1019@hotmail.com

Contents

1 Overview to MorArgAn: Moral Argument Analytics

Welcome to the MoralArgAn Interface User Manual, your guide to navigating and utilising our advanced visualization tool built for moral argument analytics. Developed using the Streamlit Library, this tool offers an online visual representation that you can access publicly here. This manual will walk you through the core features, functionalities, and components to ensure you get the most from our interface.

2 App General Structure

A comprehensive analytical framework forms the backbone of the MoralArgAn interface. The primary components of this framework include:

- Corpora Selection
- Analysis Units Determination
- Analytics Modules Selection

You can refer to the interface structure in the provided diagram (Figure 1) which offers a detailed visual representation of these components and their interrelations.

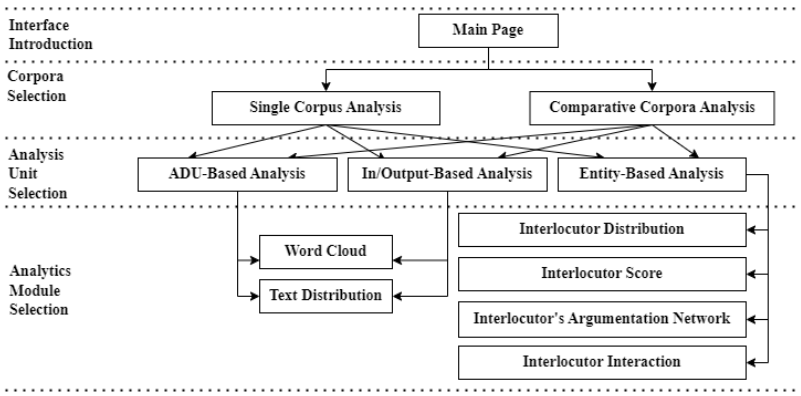


Figure 1: Interface Structure

3 App Functionality

This section will provide a deep dive into the fundamental components of our interface, which are pivotal for understanding the moral argument analytics. With the intention of offering a streamlined experience, we'll delve into the specifics of Corpora Selection, Unit Selection, and the Analytics Module.

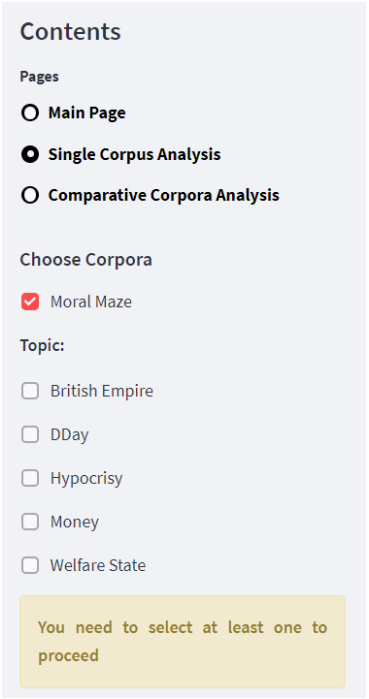
3.1 Corpora Selection

Before embarking on an analysis, it's crucial to understand the data source or the corpus you'll be working with. At MoralArgAn, our primary data source is the Moral Maze Corpora. The Moral Maze (MM) is a BBC Radio 4 show where panellists debate ethical and

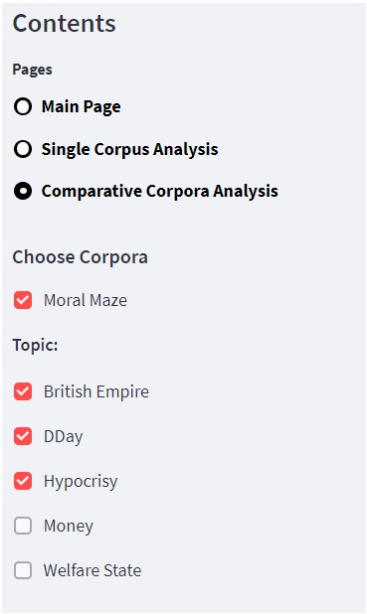
Table 1: General statistic description for MM corpora. Asterisk indicates corpora that are significantly smaller or larger than the average of 7,700 words per MM corpus. Total indicates that the statistic was calculated according to the whole MM corpora.

Topic	# of ADUs	# of Words	# of Speakers	# of Arguments
MM: British Empire	329	4,752*	19	190
MM: DDay	260	7,271	13	98
MM: Morality of Hypocrisy	639	10,050*	10	256
MM: Morality of Money	504	8,102	23	294
MM: Welfare State	488	8,322	26	298
Total	2,220	38,497	91	1136

moral topics. From this, a publicly accessible corpus was curated, highlighting debates across 5 themes including British Empire, DDay, Morality of Money, Morality of Hypocrisy and Welfare State. The collected corpora are divided into 2,220 Argumentative Discourse Units (ADUs) containing 38,497 words spoken by 91 speakers. Utilising the Inference Anchoring Theory (IAT) for annotation, we centered on two main proportional relations: supports and attacks. From our comprehensive assessment, we identified 1,136 distinct arguments, underlining the corpus's richness for rhetorical and argumentative research.



(a) Single Corpus Selection Operation



(b) Comparative Corpora Selection Operation

Figure 2: Corpora Selection Operation

Options:

- Single Corpus Analysis: Opt between a single or multiple corpora from the Moral Maze series. When multiple corpora are chosen, they are accumulated to facilitate topic-agnostic moral value analytics.
- Comparative Corpus Analysis: Designed for contrastive study, you'll need to activate at least two corpora from the Moral Maze series concurrently.

3.2 Unit Selection

Determining the right unit of analysis is essential to retrieve accurate and meaningful results. Our platform offers multiple perspectives to scrutinise the data.

Options:

- ADU-Based Analysis: Engage with all locutions from the selected corpora, adhering to the argumentation discourse units' segmentation.
- In/Output-Based Analysis: Focus primarily on argument supports and attacks, allowing for an intricate look into the constituents of these arguments, i.e., inputs and outputs, either individually or collectively.
- Entity-Based Analysis: Turn your attention to the debate's speakers. Dive deep into understanding their moral value orientations and witness how these values shape the entire discourse's structure.

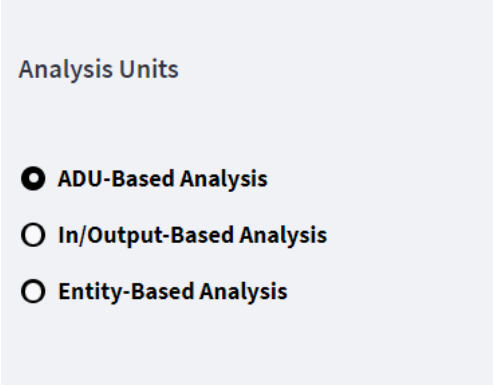


Figure 3: Unit Selection Operation

3.3 Analytics Module

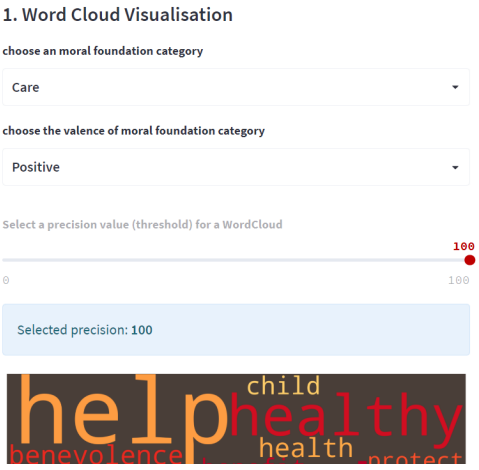
The analytics module is where the magic happens. It's designed to bring forth the underlying patterns, insights, and intricacies within the selected corpora.

3.3.1 Moral Value Detection

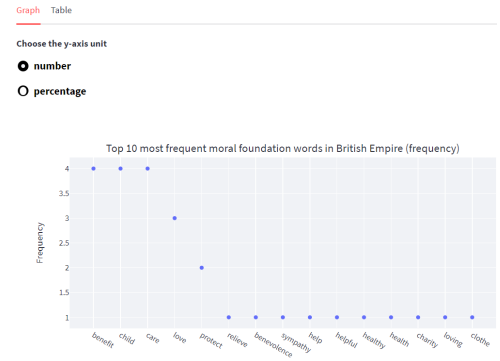
Empowering our analytics is the Moral Foundations Dictionary (MFD), tailored for moral value detection. We also include a distinctive category termed "No moral", spotlighting segments that are overtly devoid of moral values.

3.3.2 Module Functionality

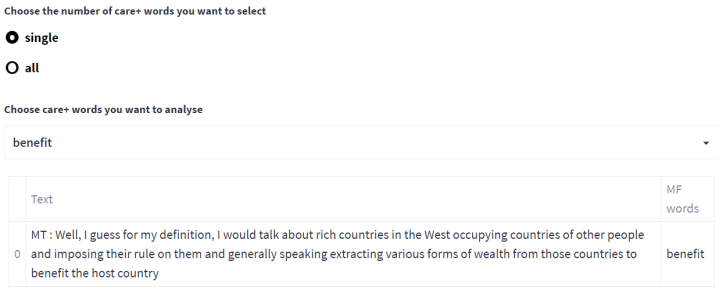
Word Cloud: Visualize moral foundation words, accompanied by both quantitative and qualitative insights. This module encompasses three integral components: (a) Word Cloud



(a) Qualitative Analysis: Word Cloud Visualisation



(b) Quantitative Analysis: Top 15 Moral Foundation Word Frequency



(c) Qualitative Analysis: Lexical Analysis of Textual Content

Figure 4: Qualitative and Qualitative Analysis in Word Cloud Module

Display: Enables selection based on moral foundation and moral valence to showcase specific lexemes present within the corpora (see Figure 4(a)). (b) Word Frequency Analysis: Illustrates the top 15 lexical frequencies associated with a chosen moral foundation and valence within the selected corpus. Users can toggle between numerical and percentage views for different y-axis scales. Visualization options include both a bar chart and a numerical table, switchable via tab selection (see Figure 4(b)). (c) Qualitative Analysis: Exhibits text segments containing the specified moral foundation words, as initially pinpointed in the Word Cloud Display. Users can display segments given specific word selection using the "single"

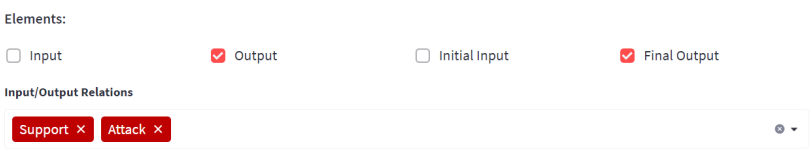


Figure 5: Additional Setting for In/Output-based Analysis

option or view all segments with all words that fall into a given selected moral foundation category directly with the "all" option (refer to Figure 4(c)).

Note: The aforementioned configurations are specifically tailored for ADU-based analysis. When transitioning to the In/Output analysis, users have the added flexibility to make selections (refer to Figure 5) based on propositional relations (either support or attack) and distinct argument elements (either input or output).

Text Distribution: Map the distribution of moral values in arguments, encompassing topic specificity, propositional relationships, and argument elements. Specifically, within the

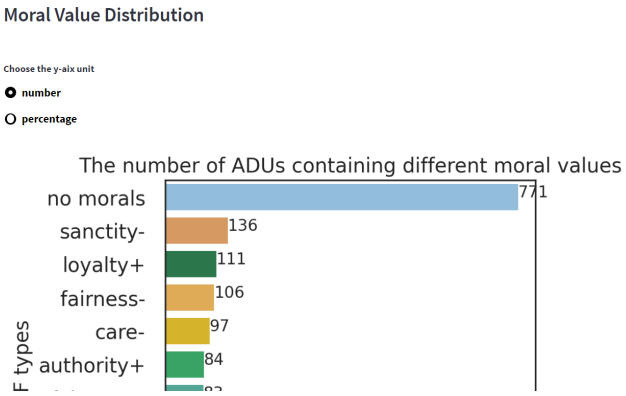


Figure 6: Moral Value Distribution Page (Tailored for ADU-based Analysis)

ADU-based analysis, users can choose between 'percentage' and 'number' for varying y-axis scales (see Figure 6). When exploring the in/output-based analysis, there's an added granularity where users can further delineate their investigation by choosing specific relations (support or attack) and distinct argument elements (input or output).

Interlocutor Distribution: Get a graphical representation of the different types of interlocutors based on their moral foundation expressions. Note that this module is specifically designed for Entity-based analysis. Users have the option to select between 'percentage' and 'number' for different y-axis scales. The module offers three distinct bar chart visualizations: 'grouped bar chart' (refer to Figure 7(a)), 'stacked bar chart' (refer to Figure 7(b)), and 'layered bar chart' (refer to Figure 7(c)).

Interlocutor Score: Explore each speaker's discourse in terms of moral value expression densities. Please be aware that this module is exclusively tailored for Entity-based analysis. We've computed the percentage of text encompassing particular moral values for each speaker in the selected corpora and represented the results in a heatmap format (see Figure 8).

Interlocutor's Argumentation Network: It visualises the conversational argumentation between different speakers during the debate considering their moral valence strategies. The resulting network structure can reveal the formation of distinct groups, rooted in moral values, as a consequence of the ongoing argument exchange. Kindly note that this module is specifically designed for Entity-based analysis. To visualize the results, you must select a particular moral foundation (see Figure 10).

Interlocutor Interaction: It manifests the argumentative interaction pattern by analysing the interlocutor argumentation network presented, focusing specifically on argument exchange frequency. Kindly note that this module is specifically tailored for Entity-based analysis. To visualize the results, you must select a particular moral foundation (see Figure 10).

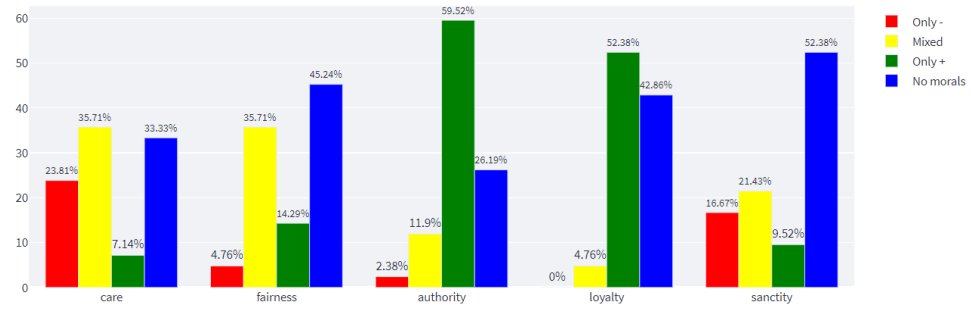
3.3.3 Notes on Comparative Corpora Analysis

When delving into comparative corpora analysis, there are some nuances and specificities to be aware of:
Modules Preservation: Of the six modules introduced throughout this manual, all those associated with ADU-based and In/Output-based analysis remain intact and functional for comparative corpora analysis.
Entity-based Analysis: In the context of comparative analysis, the entity-based framework is somewhat streamlined. Only the 'Interlocutor Distribution' module remains active. For users aiming to derive a side-by-side comparison of different corpora, the system introduces three new comparative bar chart visualisations as we mentioned before with different emphasis:(1)Comparative Grouped Bar Chart; (2)Comparative Layered Bar Chart; (3)Comparative Stacked Bar Chart. In addition to the bar charts, a spider (or radar) chart is also available for users (refer to Figure 11). This chart visualises the average user moral score across each corpora. Each axis of the spider chart represents a different moral foundation, and the radial distance from the centre signifies the average moral score. It's an intuitive way to understand and compare the moral dynamics at play in different argumentative datasets.

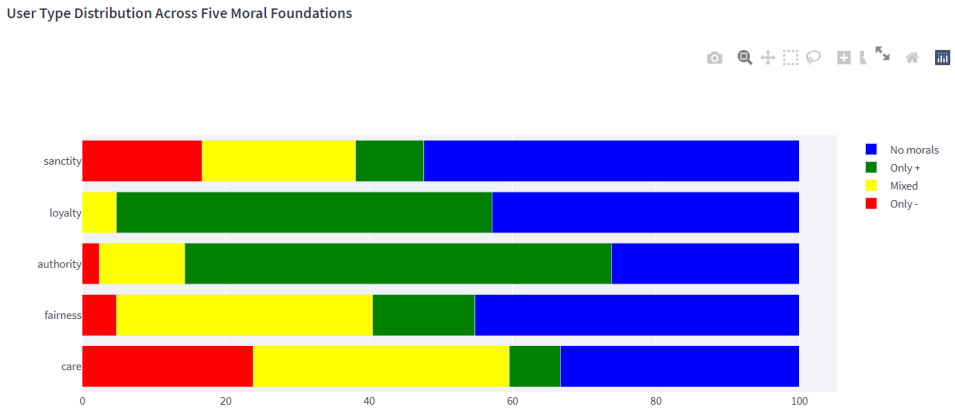
4 Conclusion

Throughout this user manual, we have endeavoured to provide a comprehensive guide to utilising the features and functions of the MoralArgAn. As you familiarize yourself with the Interface and its functionalities, we encourage you to regularly revisit this manual for clarification and guidance. Additionally, with the evolving nature of technology and research, it's essential to stay updated on the latest features and best practices associated with the system.

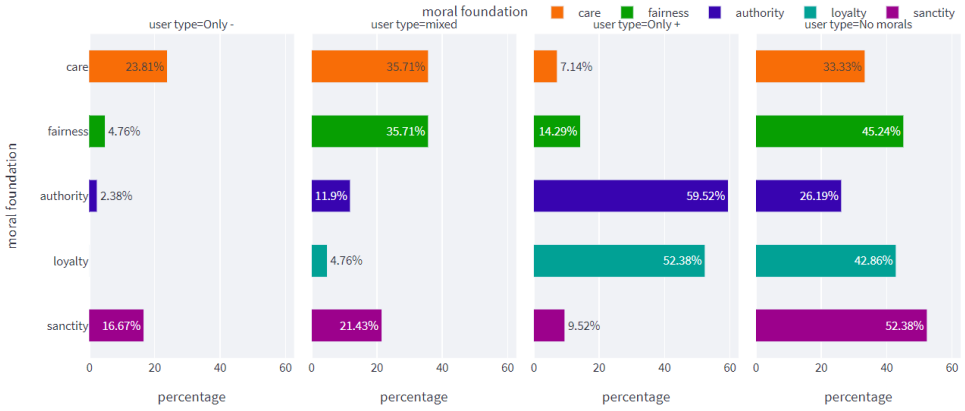
In closing, we hope that this manual has served as a valuable resource in your journey to decode and understand the intricate web of moral values in argumentation. Happy analysing!



(a) Grouped Interlocutor Distribution



(b) Stacked Interlocutor Distribution



(c) Layered Interlocutor Distribution

Figure 7: Interlocutor Distribution

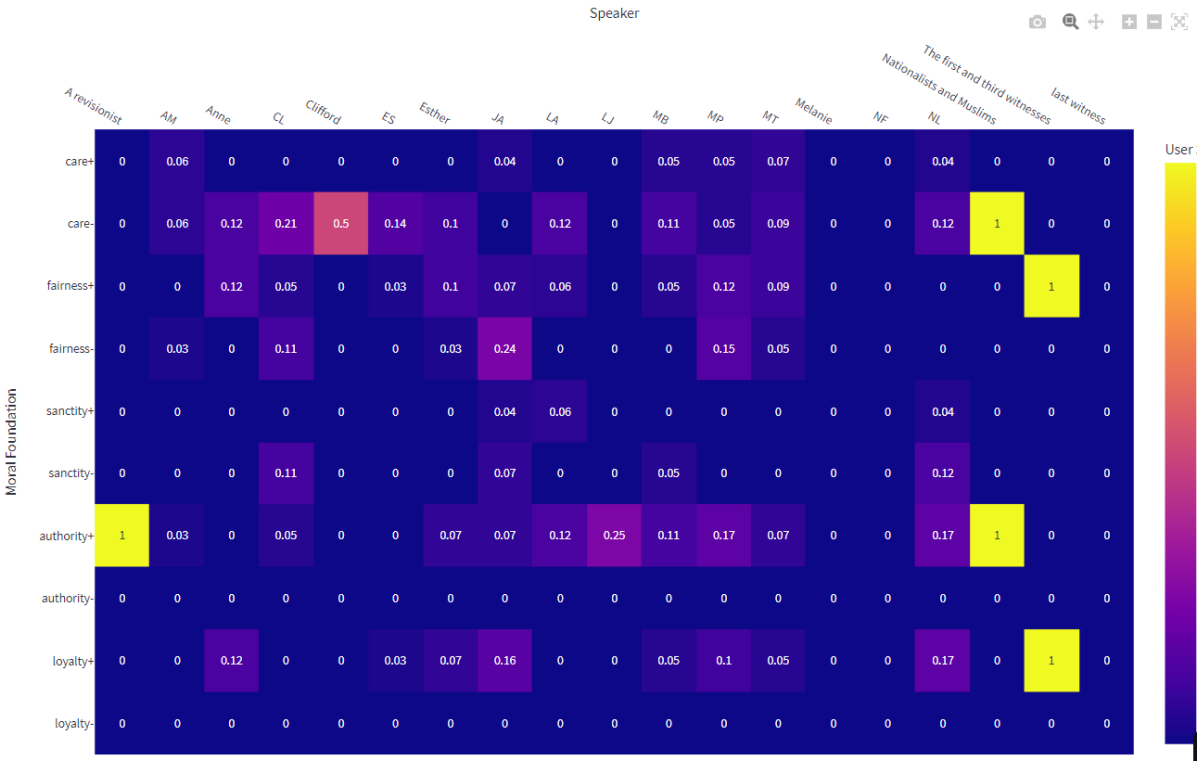


Figure 8: Interlocutor Score

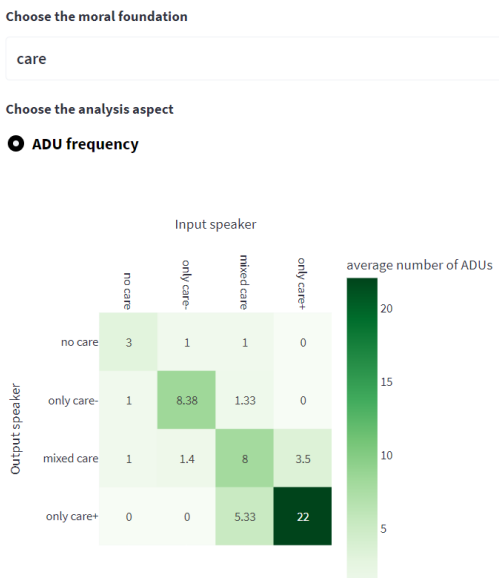


Figure 9: Interlocutors' Argumentative Interaction Frequency

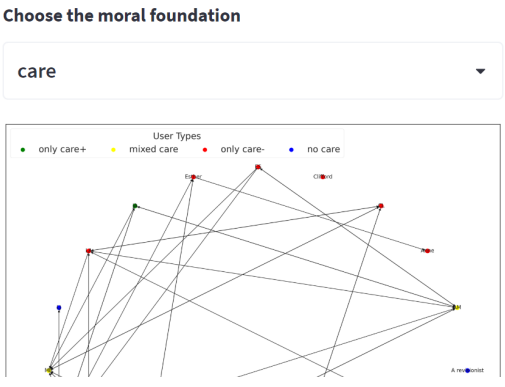


Figure 10: Interlocutors' Argumentative Network

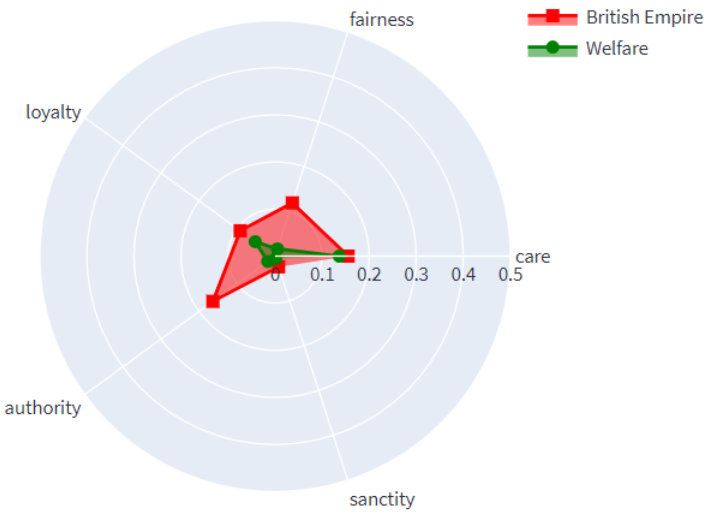


Figure 11: Interlocutors Radar Chart