Towards a More In-Depth Detection of Political Framing

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Abstract

In social sciences, recent years have witnessed a growing interest in applying NLP approaches to automatically detect framing in political discourse. However, most NLP studies by now focus heavily on framing effect arising from topic coverage, whereas framing effect arising from subtle usage of linguistic devices remains understudied.

In a collaboration with political science researchers, we intend to investigate framing strategies in German newspaper articles on the "European Refugee Crisis". With the goal of a more in-depth framing analysis, we not only incorporate lexical cues for shallow topic-related framing, but also propose and operationalize a variety of framing-relevant semantic and pragmatic devices, which are theoretically derived from linguistics and political science research. We demonstrate the influential role of these linguistic devices with a large-scale quantitative analysis, bringing novel insights into the linguistic properties of framing.

1 Introduction

Framing is a ubiquitous strategy to promote certain views, values or ideologies in political discourse: the information sender selectively makes certain aspects of an issue more salient in the discourse while excluding or denying the others, with the aim of ultimately influencing the public's opinions and behaviors (Gamson, 1985; Entman, 1993). In recent years, automated framing detection has received increasing attention in both NLP and social sciences. In an interdisciplinary project, we are interested in identifying framing strategies employed by different German newspapers in the discourse of the event "European Refugee Crisis" between 2014–2018, where a large amount of asylum seekers from war-torn countries in the Middle East and North Africa flooded into Europe.

By now, most of the NLP studies on automated framing detection have been focusing on *topical framing*, e.g, whether the topic of economic impact or cultural value is more dominant in the discourse of migration (see, inter alia, Khanehzar et al., 2021; Mendelsohn et al., 2021; Huguet Cabot et al., 2020). However, little is known about the linguistic properties of framing: in the existing NLP work, there is very few in-depth investigations on the effects of individual linguistic components in framing, which is mainly because many studies use neural networks (NNs) that lack explainability and do not allow a drilling down into the effects of linguistically meaningful components (see Section 2 for a detailed review). Moreover, the majority of the earlier studies apply supervised approaches which rely on intense manual annotation effort. This has led to a bias towards English in the research of framing detection: whereas several English datasets with annotations of framing have been released (see Section 2), for any language other than English, to our best knowledge, there is still no annotated dataset to date.

Addressing the lack of investigation on the linguistic aspects of framing, we bring together both shallow topical cues and in-depth linguistic devices to detect framing strategies in German newspaper articles on European Refugee Crisis. The novelty of our work is the investigation of how subtle semantic and pragmatic features contribute to framing a message: in theoretical linguistics, researchers have discovered a variety of subtle linguistic devices that play a fundamental role in expressing the speaker's attitude or leading the addressees to integrate information into their belief systems in a certain way. Consider the highlighted expressions in Example (1): the expression *nicht einmal* 'not even' reinforces the author's critical attitude to the ruling parties by conveying that the meaning of family in asylum cases should be the most basic knowledge they ought to have, but actually they do not. Besides, by using the modal particle *ja*, which does not have an English equivalence but can be loosely paraphrased to 'as we

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all know', the author subtly renders his opinion as already being a consensus of all people (even if this might not be true), covertly increasing its credibility.

(1) *Die drei Parteien wissen ja nicht einmal, was im Falle der Flüchtlinge* [...] *unter Familie zu verstehen ist.*
'The three (ruling) parties do not even understand what family means in the case of the refugees - as we all know.'
(source: *Frankfurter Allgemeine Zeitung*)

Linguistic devices of such kind do not contribute to the topical content of the text, but frame the utterance by adding rhetorical flavors that reinforces specific stances of the author. In what follows, we refer to such framing effect as *rhetorical framing*. Building upon linguistic theories and insights from political science research on framing, we operationalize a set of deep semantic and pragmatic features that are relevant to rhetorical framing, and apply them to data-driven framing detection in a large-scale dataset with 8 million tokens. Our study makes the following contributions: **(a)** at the theoretical level, we propose a variety of deep semantic and pragmatic features relevant to framing, and illustrate their subtle yet powerful role in framing with a quantitative study. Our proposed linguistic features provide novel insights towards a deeper understanding of framing, and can also inform future work on creating annotation schemata for framing. **(b)** At the methodological level, we release a heuristic-based automated annotation pipeline for the proposed linguistic features.[1]

2 Related Work

The release of *The Policy Frames Codebook* (PFC; Boydstun et al., 2014) has facilitated the task of creating datasets and building models for automated framing detection. PFC proposes 14 topic-oriented frame categories that can be applied to any policy issue, e.g., *economic frames*, *morality frames*, or *security and defense frames*. This has provided a convenient basis for building annotation and classification. Since then, researchers have published several English-language datasets with manual annotation of frames using the taxonomy of PFC or a similar topic-oriented fashion (e.g., Card et al., 2015; Liu et al., 2019; Mendelsohn et al., 2021).

Owing to the PFC and these publicly available datasets, previous NLP work on framing has mainly focused on identifying *topical framing*. The recent SemEval 2023 Shared Task on framing detection[2] also adopts this topic-oriented setting. The approaches applied in previous studies range from fully unsupervised to fully supervised methods: Tsur et al. (2015) and Nguyen et al. (2015) rely on unsupervised topic models. Field et al. (2018) and Yu and Fliethmann (2022) compile framing vocabularies to measure the prevalence of different frames. Using a fully supervised fashion, Baumer et al. (2015) build Naïve Bayes classifier using theoretically derived linguistic features. More recent work has been leveraging powers of NNs, e.g., Naderi and Hirst (2017) (LSTM) and Ji and Smith (2017) (RNN). Especially, Transformer-based language models have been widely used in the last years (Hartmann et al., 2019; Akyürek et al., 2020; Huguet Cabot et al., 2020; Khanehzar et al., 2021; Mendelsohn et al., 2021; Bhatia et al., 2021; Hofmann et al., 2022).

However, studies using topic-oriented taxonomies of framing tend to oversimplify the concept of framing as a mere matter of topic coverage. This is insufficient for a deep understanding of framing. In political science, it is widely pointed out that framing is a multi-faceted phenomenon: it includes not only the information sender's intention of reinforcing specific topics, but also the facet of how the frames in a communication process affect the individual's thought (Chong and Druckman, 2007; Druckman, 2011). For the second facet, the usage of subtle linguistic devices can play a crucial role. Especially, certain pragmatic markers have an effect in manipulating mutual assumptions or facilitate processes of pragmatic inferences (Furko, 2017). In NLP, the impact of individual linguistic components in framing remains understudied with only a few exceptions: Baumer et al. (2015) utilize various semantic cues (*factive verb*, *assertive word*, *entailment* and *hedging*) to classify framing, but the authors do not provide discussion on what textual or rhetorical effect these cues have in framing a message. Demszky et al. (2019) and Ziems and Yang (2021) inspect the usage of deon-

[1] The dataset used in our study was purchased from the publishers. Due to their copyright regulations, the dataset is restricted to project-internal usage and unfortunately cannot be distributed to third parties. But all code and lexical resources resulting from this paper are publicly available at: https://github.com/qi-yu/topical-and-rhetorical-framing

[2] https://propaganda.math.unipd.it/semeval2023task3/

tic modal verbs (e.g., 'should', 'need') in calling for actions, assigning blames and making moral arguments. However, their argued importance of modal verbs only applies to texts with a primary function of calling to actions, but does not necessarily generate to all text types. Ziems and Yang (2021) investigate the usage of agentless passives (e.g. using 'He was killed' instead of 'He was killed *by police*') in removing blames. Yu (2022) shows that iterative adverbs such as 'again' can compose systematic framing strategies by evoking attitudinal subtexts via presuppositions. We follow this strand of work on linguistically informed framing detection, and quantitatively investigate the effect of a wider variety of semantic and pragmatic cues. We aim at extending the existing knowledge on the linguistic composition of framing.

3 Data

We focus on a dataset comprising of articles about the "European Refugee Crisis" published between 2014 to 2018 by the three most circulated newspapers in Germany: *BILD*, *Frankfurter Allgemeine Zeitung* (FAZ), and *Süddeutsche Zeitung* (SZ). All three are nationwide daily newspapers, and they build a balanced sample of different styles (tabloid vs. quality) and political orientations.

From each newspaper, we first collected articles with at least one match of the following quasi-synonyms of 'refugee' (including their inflected forms): {*Flüchtling*, *Geflüchtete*, *Migrant*, *Asylant*, *Asylwerber*, *Asylbewerber*}. We then removed articles that were: 1) duplicated, 2) from non-political sections such as *Sport*, and 3) with a ratio of the 'refugee'-synonyms lower than 0.01. Criterion 3) was experimentally defined: it allowed us to remove most articles that mention the European Refugee Crisis only as a side-topic. Table 1 summarizes the final dataset.

Source	Type	#Articles	#Tokens
BILD	C, T	12,107	3,188,561
FAZ	C, Q	6,686	3,432,080
SZ	L, Q	4,536	1,812,835

Table 1: Dataset overview. (C = conservative; L = liberal; T = tabloid; Q = quality)

4 Operationalizing Framing

As we do not have any annotation of frames available for our dataset - moreover, it is prohibitive to conduct such annotation considering the enormous labor cost, we use a set of theoretically derived topical and rhetorical features to conduct a data-driven exploratory framing analysis on the document level. The proposed rhetorical features (Section 4.2) also aim to fill the research gap in investigating the linguistic properties of framing. The features and their relevance to framing are described below.

4.1 Topical Framing

We apply the *Refugees and Migration Framing Vocabulary* (RMFV) by Yu and Fliethmann (2022) as a proxy to measure the topical frames in different newspapers. RMFV contains vocabularies for the following 9 frame categories specifically designed for the issue of refugees and migration:

- ECONOMY, IDENTITY, LEGAL, MORALITY, POLICY, POLITICS, PUBLIC OPINION, SECURITY, WELFARE

For each article, we compute the ratio of the vocabularies of each frame category F. An article is considered as having a stronger emphasis on the topical frame F if the vocabularies of F show a higher ratio, i.e., occur more often.

4.2 Rhetorical Framing

(I) Arousal Former research in political communication has found that framing an issue with emotionally charged language can make a persuasive impact on the addressee (Gross, 2008; Cheng, 2016; Nabi et al., 2018). Thus, we incorporate the AROUSAL degree of the language as one dimension of rhetorical framing. To this end, we apply the arousal ratings of German lemmas by Köper and Schulte im Walde (2016), which include a large range of 350,000 tokens. For each article, we measure the average arousal rating of all its tokens.

(II) Presupposition In natural language, a speaker often *presuppose* certain information, i.e., assume that the information is already part of the *common ground* (shared belief) between them and the addressee (Stalnaker, 2002). In political discourse, presuppositions can bring up attitudinal messages in a hidden manner. Example (2) shows such a case: the adverb 'even' triggers the presupposition that other measures have already been taken to alleviate the overcrowded infrastructure, and that setting up tents was the most unexpected measure (see the semantics of 'even' in Giannakidou, 2007; Szabolcsi, 2017). The message that the

city already needs the most surprising measure renders the consequence of refugee influx as dramatic.

(2) *Die Einrichtung dort* [in Giessen] *ist überfüllt. Nun wurden sogar Zelte aufgestellt.*
'The infrastructure there [in Giessen] is overcrowded. Even tents were set up.'

As presupposition is extremely widespread in natural language (e.g., the usage of person names also presupposes the existence of the referred persons), we cannot include all possible types of presupposition triggers in our study. Here, we specifically focus on two types of presupposition triggers:

- SCALAR PARTICLES: e.g., *sogar* 'even', *nicht einmal* 'not even'
- ADVERBS FOR ITERATION OR CONTINUATION: e.g., *wieder* 'again', *andauernd* 'continuously'. Especially in the discourse of a crisis, adverbs of continuation such as 'continuously' are typical devices used to frame the event as being long-standing, which is often connected to criticism.

We compiled a list for triggers of these two types based on seed items found in König (1981) and Yu (2022), and their synonyms found using GermaNet (Hamp and Feldweg, 1997; Henrich and Hinrichs, 2010). For each article, we calculate the ratio of each trigger type, defined as their count divided by the article's token amount.

(III) Modal Particles German has a rich inventory of *modal particles*: they are words that do not contribute to the propositional content (i.e., descriptive, or truth-conditional content) of an utterance, but indicate how the speaker thinks that the content of an utterance relates to the common ground with the addressee (Thurmair, 1989; Zimmermann, 2011; Bross, 2012). Thus, they subtly manipulate how a proposition should be received by the addressee, constituting framing devices par excellence. We explore the usage of the following types of modal particles:

- MODAL PARTICLES SIGNALING COMMON GROUND: *ja* (literal translation: 'yes'). Expressions in the form of *ja*(φ) (i.e., *ja* modifying a proposition φ) convey that the speaker believes φ to be uncontroversial (Zimmermann, 2011).[3]
- MODAL PARTICLES SIGNALING RESIGNED ACCEPTANCE: *eben* (lit. 'even/flat'), *halt* (lit. 'stop'). *eben/halt*(φ) conveys that the speaker believes φ to be obvious and can not be altered, and therefore has to be accepted (Bross, 2012).
- MODAL PARTICLES SIGNALING WEAKENED COMMITMENT: *wohl* (lit. 'probably'). *wohl*(φ) conveys that speaker considers φ to be highly probable or plausible, but φ could also possibly be falsified (Zimmermann, 2011).

As mentioned in Section 1, there is no real English equivalence for the German modal particles discussed here. Nevertheless, to illustrate their effects clearer, we provide coarse paraphrases of their meaning (adapted from Hautli-Janisz and El-Assady, 2017) in Example (3) below:

(3) *Die Flüchtlinge müssen ja / eben (halt) / wohl zunächst Deutsch lernen.*
'The refugees must learn German first, as we all know/that's how it is/I assume.'

For each article type, we calculate the ratio of each modal particle category. Here we do not count their usage in direct or indirect quotations as marked respectively by quotation marks or the German *subjunctive I*, because the stances conveyed by the modal particles are always attributed to their speakers (see descriptions above), and we are only interested in investigating the stances of the newspaper article authors: for instance, if a newspaper article author writes the sentence *Peter sagt: "Die Flüchtlinge müssen eben Deutsch lernen."* (Peter says: "The refugees must learn German - that's how it is."), the resigned acceptance conveyed by the modal particle *eben* is attributed to Peter, not the author.[4]

(IV) Sentence Type In news articles, while declarative sentences are the most often used, the usage of questions and exclamatory sentences also has its own cognitive and rhetorical effects. Questions can add an interactive style to a text (Scheffler, 2017): especially, we observe that newspaper articles occasionally use questions, typically at the beginning of the article, to bring up a topic and trigger the readers to think along. Exclamatory sentences carry a two-fold function: besides the obvious function of expressing strong emotion, they

[3] Whereas another German modal particle *doch* also signals common ground, we refrain from incorporating it into our analysis, because *doch* is ambiguous between many senses and it is often difficult to disambiguate them without prosodic information.

[4] As the effects of the features in (I), (II) and (V) regarding framing are not affected by such perspective shift when used in quotations, we do not exclude their quotation usage.

also mark the propositional content of the utterance as evident (Faure, 2017). For each article, we calculate the ratio of QUESTION and EXCLAMATORY SENTENCES, defined as their count divided by the article's total sentence amount. We exclude their usage in quotations due to the same reason as described in (III) above.

(V) Information Structure The political information acquisition of individuals concerns not only the *factual knowledge*, i.e., whether one correctly knows certain events or political figures, but also the *structural knowledge*, i.e., how the factual information is interrelated and organized (Tolochko et al., 2019). In natural languages, the usage of DISCOURSE CONNECTIVES, i.e., words or phrases that link together two or more utterances in a discourse and signal the relationship between them, has a crucial function of revealing coherence between events and conveying instructions about how to integrate this information (Gernsbacher, 1997; Graesser et al., 2004). In terms of German, a recent empirical study by Blumenthal-Dramé (2021) shows that the presence of discourse connectives benefits German speakers in recognizing the discourse relation. Therefore, we assume that using discourse connectives in news articles facilitates the reader's acquisition of structural knowledge. For each article, we calculate the cumulative ratio of the following types of DISCOURSE CONNECTIVES: *adversative* (e.g., *jedoch* 'yet'), *causal* (e.g., *da* 'because'), *concessive* (e.g., *obwohl* 'though') and *conditional* (e.g., *wenn* 'if').

5 Experimental Setup

5.1 Automated Feature Annotation

The detection for many features in Section 4 is straightforward, as it can be either based on existing lexical resources or unambiguous cue words. Nonetheless, reliably identifying the German modal particles and discourse connectives is extremely challenging due to their highly ambiguous nature: for instance, the causal connective *da* also has the locative adverb usage 'there'. However, there are very few previous NLP work we can build on. To our best knowledge, by now there is still no labeled dataset that covers a comprehensive enough range of German modal particles or discourse connectives, which could enable us to train machine learning models. The only exception is El-Assady et al. (2017), who integrate a rule-based annotation system of these features into the visual discourse analysis tool *VisArgue*.

The cue list and disambiguation rules of VisArgue are curated by experts of linguistics and thus theoretically valid, but the implementation of the disambiguation rules is rather inaccurate: it is mainly based on the position of a target cue in a sentence and its adjacent words. We inherit the cue list and disambiguation rules from VisArgue, but optimize the disambiguation by incorporating information of part-of-speech, morphological features and dependency relation provided by the neural-network NLP pipeline *Stanza* (Qi et al., 2020).

5.2 Determining Most Predictive Features

To quantify which features discussed in Section 4 are most distinctive in each newspaper source (BILD, FAZ and SZ), for each source we fit a binary logistic regression model using the source as response variable (e.g., `is_BILD` = 0 vs.1) and all features described in Section 4 as predictors. All feature values are standardized by removing the mean and scaling to unit variance. As the topical feature WELFARE shows a relatively strong correlation to ECONOMY (Spearman's $\rho = 0.63$, $p < 0.001$) whereas the vocabulary of ECONOMY has a broader coverage, we discard the feature WELFARE. Among the other feature pairs, no strong correlation was found (Spearman's $\rho < |0.40|$; see Figure 1 for all feature correlations).

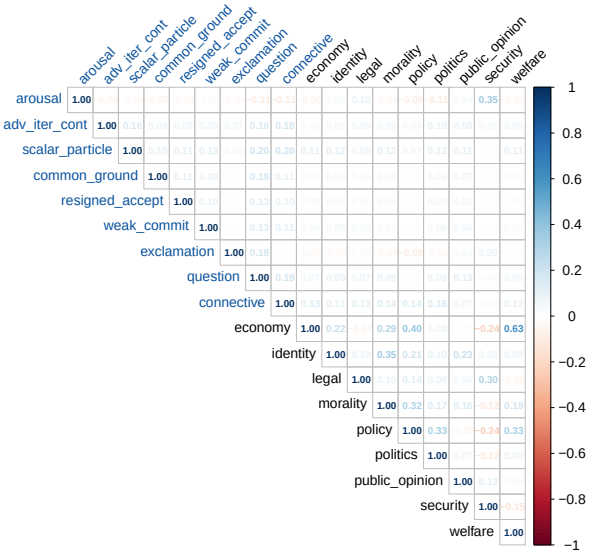

Figure 1: Correlation matrix of all features. The number in each cell shows Spearman's ρ. Blue tick labels mark the rhetorical framing features.

As inspired by Frassinelli et al. (2021), we in-

spect the z-value of each feature to find the most predictive features for each source. The z-value is defined as the ratio of the coefficient estimate divided by its standard error: a larger absolute value indicates a less uncertain estimate, which in turn implies that the distributional difference of the feature is larger between the articles belonging to the source and those not belonging to the source. Moreover, the sign of the z-value indicates the direction of effect, i.e., a positive sign indicates that the feature is predictive for articles belonging to the source, and a negative sign indicates that the feature is predictive for articles not belonging to the source.

6 Results and Discussion

Figure 2 shows the within-source frequency of each feature, computed as the count of a feature divided by the total token amount of a source. It can be observed that the rhetorical framing features are extremely sparse, especially the modal particles.[5]

Yet, the logistic regression analysis reveals interesting contrast between the usage of the features in each newspaper. Figure 3 shows the z-values of all significant features in predicting each source. The detailed results are provided in Appendix A. In what follows, we summarize the major findings from the logistic regression analysis.

6.1 Topical Framing

Among all topical features, SECURITY and MORALITY show significant effects in predicting all three newspapers, either in a positive direction or a negative direction (see Figure 3): SECURITY shows a positive effect in predicting articles from the tabloid-newspaper BILD, whereas MORALITY shows a positive effect in predicting articles from the two qualities newspapers FAZ and SZ. Considering that different items within the same vocabulary can carry different connotations and thus frame the issue in different directions, we further inspected which items within the vocabularies of these frames are most representative of each newspaper. To this end, we adapted the measure of *PMI-freq* (Jin et al., 2020) to calculate the association strength of an item i in each vocabulary set and a newspaper N. *PMI-freq* is derived from the concept of *pointwise mutual information* (PMI), but it overcomes PMI's shortage of preferring rare words by incorporating the frequency of an item into the calculation. The definition of *PMI-freq* is shown below, where $f(i)$ stands for the overall frequency of i in the whole dataset:

$$\textit{PMI-freq(i; N)} = \begin{cases} \log(f(i)) \log \frac{P(i,N)}{P(i)P(N)} & \text{if } f(i) \geq 50 \\ 0, & \text{otherwise} \end{cases}$$

Table 2 shows the top 5 items for SECURITY and MORALITY with the highest *PMI-freq*. The three newspapers show striking differences in the perspectives they emphasize: for SECURITY, all items from BILD are clearly related to criminality or terrorism, rendering the refugees as causing problems for domestic security. Words like 'assault' and 'arson' also suggest that BILD frequently focuses on individual criminal cases. In contrast, all keywords in FAZ are related to the security situation of the refugees on the migration route (e.g., 'human smuggling') or in their countries of origin (e.g., 'war'). This renders the refugees as being threatened instead of as a threat. SZ shows a mixed focus on both security situation on the migration route (e.g., 'coast guard') and illegal issues in the asylum procedure ('abuse of asylum'). Regarding MORALITY, top 3 of the 5 items in BILD are related to xenophobia. The other two items indicate a focus on the acceptance capacity ('upper limit') and the impact of refugees on the welfare system ('Hartz IV'; an unemployment benefit in Germany). This contrasts especially strongly with SZ, where most items are related to humanitarian aid and solidarity. FAZ displays a mixed focus on both humanitarian aspects ('voluntary', 'moral') and broader politico-economic issues ('economic migrant', 'international law').

6.2 Rhetorical Framing

Though the topical framing features already reveal strong differences between the newspapers, the rhetorical framing features allow us to detect more subtle framing strategies on a deeper level. In what follows, we illustrate the results with selected examples for clarity purposes, but most of the described framing effects of the features arise from their intrinsic semantics (described in Section 4.2), and thus generate beyond the selected examples.

Among all three newspapers, BILD shows the most distinctive characteristics regarding the rhetorical framing features. The positive z-values of EXCLAMATORY SENTENCES and QUESTION show an emotional and interactive language usage in BILD.

[5] This is unsurprising given that modal particles in German are more prevalent in spoken texts.

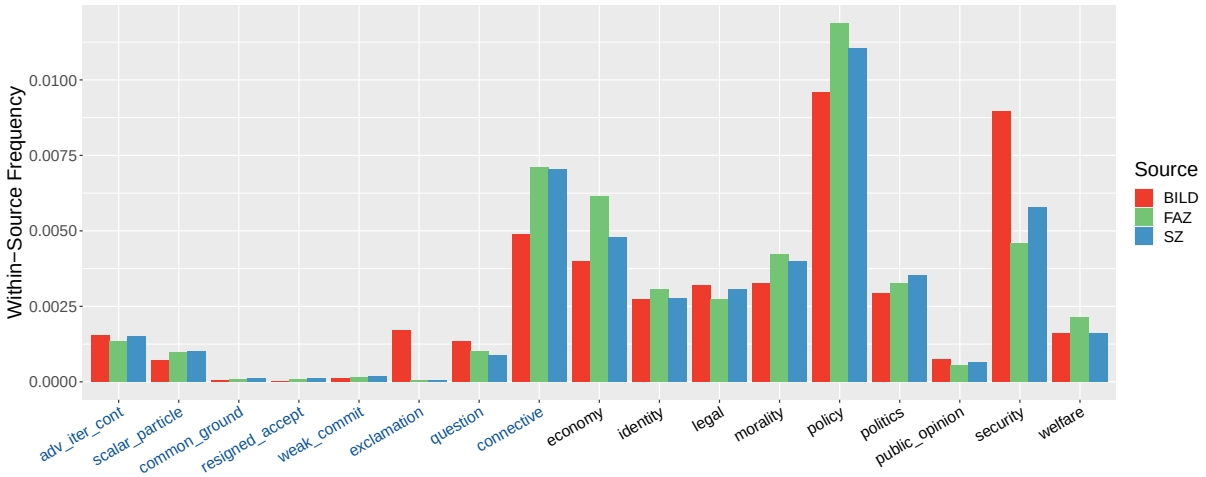

Figure 2: Within-source frequency of each feature. Blue tick labels mark the rhetorical framing features.

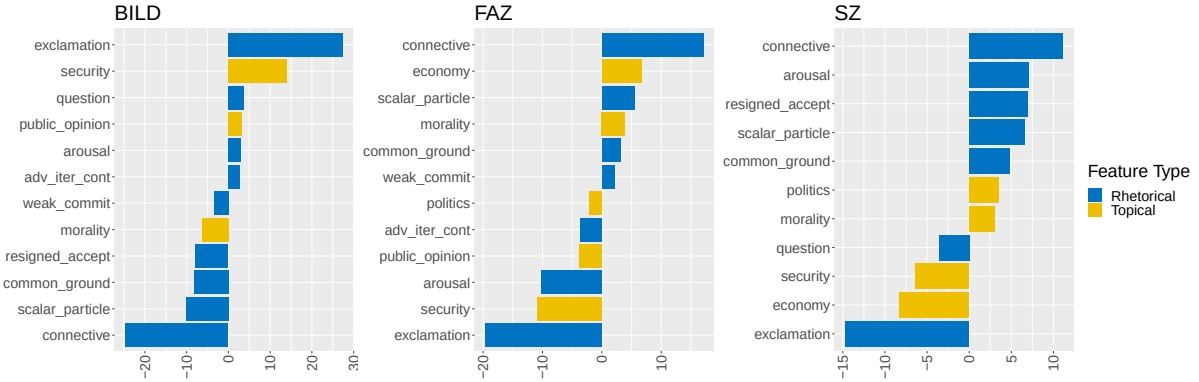

Figure 3: Z-values of each feature for BILD-, FAZ-, and SZ-articles. Only significant features are shown.

	Security	**Morality**
BILD	*ISIS*, *U-haft* 'custody', *Körperverletzung* 'assault', *Brandstiftung* 'arson', *Totschlag* 'homicide'	*fremdenfeindlich* 'xenophobic', *Anfeindung* 'hostility', *ausländerfeindlich* 'hostile to foreigners', *Hartz IV*, *Obergrenze* 'upper limit'
FAZ	*Verfolgte* 'persecuted', *Menschenschmuggel* 'human smuggling', *Verfolgung* 'persecution', *unbegleitete Minderjährige* 'unaccompanied juveniles', *Krieg* 'war'	*ehrenamtlich* 'voluntary', *moralisch* 'moral', *Wirtschaftsmigrant* 'economic migrant', *Völkerrecht* 'international law', *Verpflichtung* 'obligation'
SZ	*Schutzstatus* 'protected status', *inhaftieren* 'detain', *Asylmissbrauch* 'abuse of asylum', *Minderjährige* 'juveniles', *Küstenwache* 'coast guard'	*human* 'humane', *Humanität* 'humanity', *Existenzminimum* 'subsistence level', *Konvention* 'convention', *Solidarität* 'solidarity'

Table 2: The top 5 keywords in the vocabulary of security and morality with highest *PMI-freq* to each newspaper. The words are sorted in descending order by *PMI-freq*.

Even though their usage within quotations is not included when fitting the logistic regression model, exclamatory sentences still show a strong predictive power for BILD-articles as reflected by the large z-value. This indicates that exclamatory sentences are systematically employed in BILD. Here it is worth pointing out the powerful effect of exclamatory sentences in framing a message as evident or factive: e.g., Example (4) not only conveys a sensational flavor, but also emphasizes that *it is a fact* that the refugees do not want to be accommodated in the gymnasiums. This covertly prevents

the readers from further questioning the plausibility of the information.

(4) *Viele Flüchtlinge wollen gar nicht in den Turnhallen wohnen!* (BILD)
'Many refugees don't want to be accommodated in the gym!'

The positive z-values of AROUSAL and ADVERBS FOR ITERATION OR CONTINUATION also reflect a sensational language style in BILD. Especially, the positive effect of adverbs for iteration or continuation indicates that BILD is more likely to render certain events or aspects as long-lasting or repeating. This has an especially strong framing effect in the context of negative consequences of the refugee influx: e.g., in Example (5), the adverb 'continuous' insinuates that the chaotic situation should have been long since solved but still is not, shedding a negative light on the administrations.

(5) *Das seit Monaten andauernde unwürdige Chaos bei der Aufnahme von Flüchtlingen in Berlin hat zu personellen Konsequenzen geführt.* (BILD)
'The continuous undignified chaos in refugee reception in Berlin has led to personnel consequences.'

Overall, it can be observed that BILD systematically applies emotionally charged language. This is also reinforced by BILD's focus on criminality and xenophobia as mentioned in 6.1, which are both inherently emotional topics.

FAZ and SZ exhibit a more structuralized and sophisticated reporting style. CONNECTIVES, together with most of the presupposition triggers and modal particles, turn out to be predictive features for FAZ- and SZ-articles. Regarding the usage of presupposition triggers, they exhibit an interesting contrasting behavior to BILD: whereas adverbs for iteration or continuation are predictive for BILD-articles, SCALAR PARTICLES are found instead to be predictive for FAZ- and SZ-articles. Scalar particles have an inherent attitudinal characteristic. Consider Example (6): the scalar particle 'not even' presupposes that among all tasks in processing refugee cases, fingerprint collection is the most basic one. This evokes a strongly attitudinal inference that the capacity shortage in the countries under discussion has been extremely acute.

(6) *Die Staaten an der Südgrenze der EU [...] schaffen es noch nicht einmal, von jedem Ankömmling einen Fingerabdruck zu nehmen.* (FAZ)
'The states on the southern border of the EU [...] do not even manage to take a fingerprint of every arrival.'

Last, intriguing characteristics in the usage of modal particles can also be observed from FAZ and SZ. Even though modal particles are rather typical in speech instead of highly-edited written texts, and we did not consider their usage within quotations, most of the modal particle categories still show a significant effect in predicting FAZ- and SZ-articles. This implies that there is indeed an intentional usage of them by journalists of the two newspapers. Modal particles for COMMON GROUND, i.e. *ja*, are predictive for both FAZ- and SZ-articles. As *ja* conveys that the propositional content of the sentence is already in the common ground between the author and the readers, its usage frames a message as uncontroversial and covertly makes the message difficult to refute. For instance, the *ja* in Example (7) renders the author's stance *Merkel is right* as being already accepted by all readers, thereby tricking the readers to agree with him.

(7) *Merkel hat ja recht: Deutschland kann seine Grenzen nicht schließen.* (SZ)
'Merkel is *ja* right: Germany cannot close its borders.'

However, FAZ and SZ differ in their usage of modal particles for RESIGNED ACCEPTANCE and WEAKENED COMMITMENT: modal particles for resigned acceptance, i.e., *eben* and *halt*, have a high positive z-value in predicting SZ-articles but not FAZ articles. As such modal particles modify a proposition as obvious and unchangeable, they have a strong effect in imposing the reader to accept the proposition. This effect is especially typical in argumentative context: e.g., in Example (8), the model particle *eben* conveys that the author's reasoning of the death cases is obvious and thus must be accepted. Rendering the argumentation as uncontroversial subtly closes the possibility of any further challenges or discussions.

(8) *Im Mittelmeer wird derweil weiter gestorben – weil es eben für Flüchtlinge und Migranten keinen legalen Weg nach Europa gibt.* (SZ)
'Meanwhile, there are further death cases

at the mediterranean sea – because there is *eben* no legal route to Europe for refugees and migrants.'

In contrast, the modal particle for WEAKENED COMMITMENT, i.e., *wohl*, is shown to be predictive for FAZ-articles but not SZ-articles. *Wohl* as a two-faceted function: it renders a proposition as highly probable, but also conveys that the author is not fully committed to its truth. Consider Example (9): *wohl* there conveys that the author has enough plausible evidence to support his assertion that no alternative solution could be found, but also signals that this assertion is not absolutely true and could be defeated. This tactfully relieves the author from being liable for the validity of his claim.

(9) *Es gibt wohl gar keine andere Lösung , als die Flüchtlinge in den jeweiligen Ländern so schnell wie möglich in Arbeitsverhältnisse zu bringen.* (FAZ)
'There is *wohl* no other solution than to get the refugees into employment in the respective countries as quickly as possible.'

Whereas *eben/halt* has a strengthening effect, *wohl* rather weakens a proposition. Taking together the different properties of these two modal particle types and the high positive z-value of AROUSAL in SZ, it can be observed that SZ tends to use more intensive language than FAZ.

7 Conclusion and Outlook

Previous research in framing detection has focused heavily on topical framing, leaving the effect of individual linguistic devices in framing understudied. Addressing this weakness, we theoretically derived a set of in-depth semantic and pragmatic features relevant to framing, and implemented an automatic annotation pipeline for identifying them. Combining them with shallow topical framing cues enabled us to identify deeper differences in framing strategies employed by different German newspapers in the discourse of the European Refugee Crisis.

The advantage of our approach is its linguistic depth and explainability: to our best knowledge, all the proposed features have still not been studied in respect of framing in a large-scale fashion. Our work contributes to both NLP and social sciences by extending the knowledge of linguistic aspects of framing. For future NLP work on framing detection, this work has two indications: first, framing detection should not be restricted to topical frames. Many linguistic devices also play crucial roles in framing by affecting how a message should be received by individuals. Second, though handcrafted feature sets have multiple restrictions, a more in-depth framing detection can still benefit from consciously incorporating theoretically derived features. As shown by our study, the distribution of many important linguistic devices could be extremely sparse, whose effects might thus be challenging for NN-based algorithms to capture.

This work is not without limitations. First, the various types of modal particles involved in this work do not exist in all languages, and their taxonomy in different languages can vary from the one applied here. Our automated annotation pipeline is also German-specific by now. However, other rhetorical framing devices and their effects discussed in this work are language-independent and can thus be applied to framing analysis for other languages. Second, this work only covers a limited range of linguistic features: due to the lack of existing tools or annotated datasets, we adopt a rule-based approach for the automated feature identification. Some relevant cues for the rhetorical framing features are left out because their disambiguation is highly context-dependent and difficult to realize with rules. Future work will consider using our automated annotation pipeline as a weak-labeling assistance and creating datasets for detecting the linguistic features with supervised methods. Moreover, for modal particles and presupposition triggers, a more fine-grained analysis direction would be to identify the actors involved in sentences containing these devices, and detect frames using discourse network analysis on the actors (following van Atteveldt et al., 2017). Despite these limitations, we hope that our initial work on rhetorical framing strategies will facilitate future work on investigating the deeper linguistic dimensions of framing.

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A Logistic Regression Results

Table 3-5 shows the logistic regression results of all features for BILD, FAZ and SZ (see Section 5.2). The significant level is set to 0.05 in the experiment. The features in each table are sorted by the estimate in descending order (*: $p \leq 0.05$; **: $p \leq 0.01$; ***: $p \leq 0.001$).

Feature	**Estimate**	**Std. Error**	***z*-Value**	***p***
exclamation	5.145	0.187	27.486	< 2e-16***
security	0.276	0.020	14.041	< 2e-16***
question	0.069	0.018	3.773	0.00016***
public_opinion	0.049	0.015	3.183	0.00146**
arousal	0.048	0.017	2.899	0.00374**
adv_iter_cont	0.043	0.015	2.837	0.00455**
economy	0.004	0.016	0.245	0.80623
legal	-0.014	0.017	-0.831	0.40574
politics	-0.017	0.016	-1.058	0.29013
policy	-0.020	0.018	-1.104	0.26961
identity	-0.026	0.016	-1.677	0.09351
weak_commit	-0.055	0.016	-3.421	0.00062***
morality	-0.102	0.016	-6.382	1.75e-10***
scalar_particle	-0.171	0.017	-10.241	< 2e-16***
common_ground	-0.224	0.028	-8.147	3.74e-16***
resigned_accept	-0.266	0.034	-7.893	2.95e-15***
connective	-0.408	0.017	-24.664	< 2e-16***

Table 3: Logistic regression results of BILD.

Feature	**Estimate**	**Std. Error**	***z*-Value**	***p***
connective	0.262	0.015	17.061	< 2e-16***
economy	0.108	0.016	6.721	1.81e-11***
scalar_particle	0.084	0.015	5.518	3.42e-08***
morality	0.062	0.016	3.874	0.00011***
common_ground	0.049	0.016	3.115	0.00184**
weak_commit	0.033	0.015	2.175	0.02964*
identity	0.029	0.017	1.745	0.08095
policy	0.019	0.019	1.047	0.29529
resigned_accept	0.012	0.019	0.607	0.54414
question	-0.008	0.017	-0.453	0.65051
legal	-0.009	0.019	-0.487	0.62613
politics	-0.034	0.017	-2.053	0.04011*
adv_iter_cont	-0.063	0.017	-3.693	0.00022***
public_opinion	-0.069	0.018	-3.728	0.00019***
arousal	-0.182	0.018	-10.110	< 2e-16***
security	-0.254	0.023	-10.921	< 2e-16***
exclamation	-3.874	0.198	-19.605	< 2e-16***

Table 4: Logistic regression results of FAZ.

Feature	**Estimate**	**Std. Error**	***z*-Value**	***p***
connective	0.185	0.017	11.152	< 2e-16***
resigned_accept	0.151	0.022	6.912	4.76e-12***
arousal	0.136	0.019	7.052	1.76e-12***
scalar_particle	0.103	0.016	6.528	6.66e-11***
common_ground	0.082	0.017	4.813	1.49e-06***
politics	0.062	0.017	3.543	0.000396***
morality	0.053	0.017	3.036	0.0024**
weak_commit	0.030	0.016	1.892	0.05849
legal	0.023	0.019	1.232	0.21792
adv_iter_cont	0.013	0.017	0.774	0.4389
public_opinion	0.007	0.017	0.385	0.70009
identity	0.005	0.018	0.274	0.78409
policy	0.002	0.020	0.108	0.91433
question	-0.089	0.025	-3.587	0.00033***
security	-0.145	0.023	-6.343	2.25e-10***
economy	-0.167	0.020	-8.244	< 2e-16***
exclamation	-4.433	0.302	-14.684	< 2e-16***

Table 5: Logistic regression results of SZ.