ARTICLE

The heart attack of the Polish health service: metaphors, arguments, and emotional appeals in political debates

Konrad Juszczyk[1] (iD), Barbara Konat[2] (iD) and Małgorzata Fabiszak[3] (iD)

[1]Faculty of Modern Languages and Literatures, Adam Mickiewicz University Poznan, Wielkopolskie, Poland; [2]Faculty of Psychology and Cognitive Sciences, Adam Mickiewicz University Poznan, Wielkopolskie, Poland and [3]Faculty of English, Adam Mickiewicz University Poznan, Wielkopolskie, Poland
Corresponding author: Konrad Juszczyk; Email: juszczyk@amu.edu.pl

Abstract

Metaphors, arguments and emotional appeals have considerable persuasive power in political discourse, yet they are rarely studied together. To explore the interactions between these interrelated phenomena, we employ three methods of analysis: Metaphor Identification Procedure, Inference Anchoring Theory, and lexicon-based sentiment analysis. Our data come from Polish political debates broadcasted during the 2019 pre-election campaign. We test hypotheses about the frequency of the associations between metaphors, arguments and emotional appeals. Hypothesis 1 predicts that arguments containing metaphors are more frequent than arguments without metaphors, hypothesis 2 predicts that arguments containing emotional appeals are more frequent than arguments without them, and hypothesis 3 predicts that arguments with metaphors and emotional appeals are more frequent than any other combination. The results show that metaphorical arguments do not outnumber non-metaphorical ones (H1 is falsified), and arguments that are both metaphorical and emotional do not outnumber the sum of all other types (H3 is falsified). Emotional arguments are more common than non-emotional ones (H2 is verified). We suggest that when political actors articulate their arguments, they often choose a particular metaphor to evoke positive or negative emotions in their audience.

Keywords: metaphors; arguments; emotions; corpus linguistics; political discourse

1. Introduction and research questions

The study of metaphor in politics spans several fields, including cognitive linguistics (Lakoff, 2016), critical discourse analysis (Musolff, 2012), political discourse analysis (Dijk, 1997), critical metaphor analysis (Charteris-Black, 2004) and cognitive

linguistics critical discourse studies (Hart, 2018). Political discourse is rich in metaphors, as political topics such as education, economy, environment, health care, and international affairs involve abstract concepts. Researchers find the use of metaphors in discourse about such recent events as Russian–Ukrainian war (Nytspol & Kobuta, 2022), COVID-19 (Neshkovska & Trajkova, 2020), Brexit (Charteris-Black, 2019; Musolff, 2021; Negro Alousque, 2020), climate change (Deignan et al., 2019) or general, universal political problems such as corruption (Isaza & Ossewaarde, 2021), health care (Ervas et al., 2021), elections (D'Angelo & Lombard, 2008), terror (Lakoff, 2016), power division in government (Perrez & Reuchamps, 2015), racism (Asma, 1995) and migration (Porto, 2022).

These issues however, as well as being political and metaphorical, are emotionally charged. Political topics are emotional, because politicians choose to stir up public opinion with emotion in order to convince the voters to support their arguments. At the same time political topics are metaphorical, because as abstract concepts they form target domains for conceptual metaphors (Lakoff & Johnson, 1999, 2003). We find similar explanations of this interaction in studies of UK and US leaders' speeches, where metaphor is "central to the creation of persuasive belief systems […] because it exploits the subliminal resources of language by arousing hidden associations that govern our systems of evaluation" (Charteris-Black, 2004, p. 2). People differ in decision making if the problem is metaphorically framed in different ways, as it has been shown in an experiment with the framing of violence: as a virus or as a beast (Thibodeau & Boroditsky, 2011). We believe that both frames are emotionally loaded, as they both elicit fear and anger. Possible solutions, combating violence through education reform or by strengthening penalties may also elicit mixed emotions: education reform can trigger positive emotions, whereas strengthening penalties may reassure some and frighten others.

When studying the interaction between metaphors, arguments and emotional appeals in political discourse, however, we shall not rely solely on intuitive qualitative judgements, the way we used (Thibodeau & Boroditsky, 2011) as an illustration. Instead, we will use a replicable method of identifying words that appeal to emotions. We present an analysis of metaphors and emotional appeals in argumentation within political discourse based on systematic methods of annotation: Metaphor Identification Procedure (PRAGGLEJAZ Group, 2007), dictionary-based sentiment analysis (Riegel et al., 2015; Wierzba et al., 2015, 2021) and argumentative discourse units identification based on Inference Anchoring Theory (IAT) (Reed & Budzynska, 2011). Following IAT, we conceptualise an argument as a minimum of two propositions: premise and conclusion, in which one is used by the speaker to provide support for the other. In our previous study we analysed the relation between metaphors and arguments as dynamic discourse phenomena (Juszczyk et al., 2022). In the current study, we contribute an additional layer of analysis: emotional appeals, that is, cases where speakers attempt to elicit emotional responses in hearers for rhetorical gain. We selected pre-election debates as a case material for studying interactions between metaphors, arguments, and emotional appeals as in the example below:

(1)   Polska służba zdrowia jest <u>w stanie przedzawałowym</u>, (…) ona jest już po <u>dwóch zawałach i trzeciego po prostu nie przeżyje</u>. Polskie Stronnictwo Ludowe zaproponowało pakt na rzecz polskiego **zdrowia**, na rzecz **zdrowia**, na rzecz pacjenta.

Polish health service is in a heart–attack threatening condition, (…) it already had two heart attacks and will simply not survive the third one. The Polish People's Party proposed the pact for the Polish **health**, for **health**, for the patient (WKK, TVP, 01.10.2019).

In example (1) the speaker employs the argument scheme, in which the premise "Polska służba zdrowia jest w stanie przedzawałowym" ("Polish health service is in a heart-attack threatening condition…") leads to the conclusion that there is a need for the "pakt na rzecz polskiego zdrowia" ("pact for the Polish health"). He uses the metaphor POLISH HEALTH SERVICE IS A PATIENT (metaphorical expressions are underlined), which contributes to the rhetorical cohesion, and appeals to the emotions of the hearers through "zdrowie" ("health") (marked in bold) as eliciting happiness in Polish, following the classification in (Wierzba et al., 2021). If we were analyzing this example based on our intuitions rather than on automatic identification of emotional appeals, then we would also identify "zawał" ("heart attack") and "nie przeżyje" ("won't survive") as expressions appealing to negative emotions, most likely fear. But the dictionary (Wierzba et al., 2021), that is, a list of words that were evaluated and coded in the experiment and which is now used as a means for automatic identification of expressions appealing to emotions, does not contain "zawał" ("heart attack") or "nie przeżyje" ("won't survive").[1] In terms of argument analysis, the speaker uses the argument from fear appeal (Walton, 2000, p. 22), where negative or threatening result is used to justify the need for an action. This example consists of negative premise ("heart attack as a problem") and positive conclusion ("pact as a solution").

Example (1) illustrates persuasive strategies used by politicians. In this type of discourse, the speakers will combine metaphorical expressions and emotion-eliciting words into their argumentation with the aim of greater rhetorical effect, as every utterance in pre-election debates can be considered as having persuasive intent. Based on the literature presented above, we may assume high saturation of both metaphors and emotional appeals in political discourse. Hence, the aim of this study is to analyse the frequency and interaction between three discursive phenomena present in pre-election debates: metaphors, arguments, and emotional appeals, using both concepts and methods from three theoretical traditions and combining them into one cohesive methodology.

As shown in Figure 1, there are several possible combinations of discourse phenomena:

1. Texts containing only arguments (i.e., as premise or conclusion), but not metaphors or emotional appeals;
2. Texts containing arguments and metaphors, but not emotional appeals;
3. Texts containing arguments and emotional appeals, but not metaphors;
4. Texts containing arguments, metaphors and emotional appeals;
5. Texts containing only emotional appeals;
6. Texts containing both metaphors and emotional appeals but not arguments;
7. Texts containing only metaphors.

---

[1]Despite these shortcomings this method has been successfully used in many studies analyzing large data sets (Hajiali, 2020). Our study design follows this research tradition.
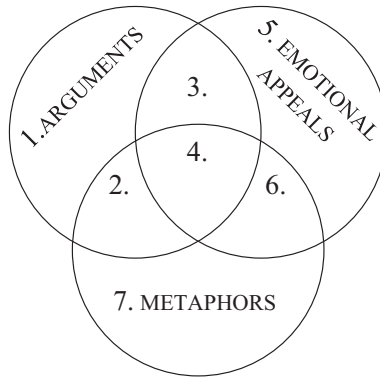
Figure 1. Discourse phenomena under investigation and their combinations.

The aim of this study is to analyse the frequency of the three discursive phenomena: metaphors, arguments, and emotional appeals and the frequency of their combinations. As shown in Figure 1, each of these phenomena may appear by themselves or in combinations of two or three. Our starting point is the identification of arguments, and the interaction of arguments with the remaining two phenomena, therefore we will not consider combinations of metaphors and appeals to emotion that may happen outside argumentative discourse units (this concept is explained in Section 2.2). We propose three hypotheses relating to the co-occurrences of the three phenomena in political discourse:

H1: Arguments containing metaphors are more frequent than arguments without metaphors.

H2: Arguments containing emotional appeals are more frequent than arguments without emotional appeals.

H3: Arguments containing metaphors and emotional appeals are more frequent than any other type (arguments without metaphors and without emotional appeals; arguments with metaphors, but without emotional appeals; arguments with emotional appeals, but without metaphors).

These hypotheses can be represented by referring to our previous Venn diagram (Figure 1):

> H1 predicts that there will be more items in the sum of areas 2 and 4 than in the sum of areas 1 and 3.
> H2 predicts that the sum of areas 3 and 4 will be bigger than the sum of areas 1 and 2.
> H3 predicts that the number of items in area 4 will be bigger than the sum of all other types of arguments in areas 1, 2 and 3. These hypotheses can be represented on the following scale (see Figure 2).

These hypotheses will undergo further specification and operationalization in terms of corpus linguistics methods in Section 3. In Section 2 we present our conceptualization of key notions used in this study: metaphors, arguments and, emotional
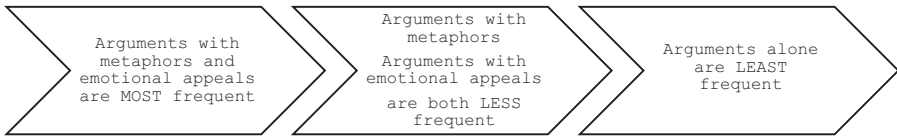
Figure 2. The scale of frequency of arguments and arguments combined with metaphors and emotional appeals from most frequent to least frequent.

appeals. Section 4 contains quantitative summary of our results, concluded in Section 5.

2. Key concepts

Metaphors, arguments and emotional appeals: all three concepts analysed in this paper can be conceived as dynamic discourse phenomena. They are realized by the speakers using linguistic means to obtain communicative goals. They are inherently pragmatic and interactive in nature: framing an issue with metaphor, arguing or appealing to emotions makes sense only if there is an interlocutor whom we want to inform, convince, or impress. In this section, we present the theoretical background for the three concepts presented in this paper and propose an initial operationalization of them in a joint research framework.

2.1. Metaphors

Political discussions, specifically political debates, represent a unique form of verbal engagement where journalists pose questions to politicians, allowing them to highlight their perspectives, criticize adversaries, and present their party's vision for a better world. These debates are intricate communication events because speakers not only respond to the host's inquiries but also address in-studio attendees and television viewers. Throughout such events, politicians employ metaphors, persuasive arguments and emotional appeals to promote their vision of the current political issues. A comprehensive meta-analysis of 91 studies of metaphorical framing in political discourse has shown that "metaphors can influence individuals' reasoning through words as well as concepts" (Brugman et al., 2019).

Our perspective stems from discourse dynamics approach to metaphor, where linguistic metaphors are analysed in order to discover what people think and how they think about it. Researchers such as Cameron, Maslen, Low and many others believe that metaphor allows to "reveal something of speakers' emotions, attitudes and values" (Cameron & Maslen, 2010, p. 7). As Cameron stated: "the affective, that is, emotions and feelings that influence human activity (Damasio, 2003), has often been neglected in metaphor studies" (Cameron, 2010, p. 78).

Metaphors are used in political discourse to simplify political topics and frame social problems (Landau et al., 2014). We assume that politicians use metaphors, arguments and emotional appeals to build and present their conceptualization of the world to the audience. In political discourse, speakers use emotion-eliciting words in combination with metaphorical understanding of socio-political situations and arguments aimed at convincing the audience of their solutions to political problems identified in metaphors. Many researchers have explored the link between emotions

and metaphors in corpus studies. Emotions expressed with metaphors were studied in the context of reconciliation talk (Cameron, 2012). Researchers (Ogarkova & Salinas, 2014) and (Reali & Arciniegas, 2014) both highlight the role of the body in shaping emotional experiences, with Ogarkova focusing on the physiological dimension and Reali on the metaphorical, framing of emotions. Studies by (Louw & Milojkovic, 2015) and (Theodoropoulou, 2012) further analyze the linguistic and experiential aspects of this link, with Louw and Milojkovic emphasizing the role of shared meaning in texts and Theodoropoulou examining the embodied experience of joy and happiness. These studies collectively suggest that emotions are not only shaped by metaphors, but also have a significant impact on the way we use and understand language. A contrastive linguistic analysis of emotion concepts is performed within-corpus and cognitive linguistics (Lewandowska-Tomaszczyk, 2019). There are also multilingual studies of emotions in metaphors, such as (Ogarkova & Soriano, 2014), who investigate the embodied conceptualization of emotions from a cognitive linguistic perspective, focusing on the metaphorical construal of the body and its parts as containers for various types of anger in English, Russian, and Spanish. Additionally, there are reasons to assume that human annotators perceive metaphorical language as more emotional and more abstract than literal language, implying that metaphorical expressions are more emotional and abstract than literal expressions (Piccirilli & Schulte im Walde, 2022).

Metaphors as unit of analysis, following MIP (Metaphor Identification Procedure) (PRAGGLEJAZ Group, 2007), are understood here as words whose basic dictionary meaning and contextual meaning differ. Such words are metaphorically used expressions which, according to *Conceptual Metaphor Theory* (Lakoff, 1993, 2016; Lakoff & Johnson, 1999, 2003), are realizations of conceptual metaphors. Moving from the word level to the conceptual level allows researchers to identify systematic mappings between concrete and abstract concepts, where the latter can be expressed, described and understood through the former.

2.2. Arguments

Inference Anchoring Theory (IAT) (Reed & Budzynska, 2011) provides the framework for understanding arguments as dynamic discourse phenomena occurring when the speaker attempts to persuade the hearer during dialogical interaction. Based on the concepts of dialogical turns and illocutionary forces, IAT postulates that each inference (i.e., the relation between premise and conclusion of an argument) is "anchored" in dialogical exchange. According to IAT, arguments are constructed between dialogical turns and are related to the speech act of arguing, making them highly dynamic and pragmatic in nature. This approach is suitable for the material proposed in the current paper – pre-election debates – which consists of spoken arguments, uttered in highly persuasive contexts.

In terms of argument structure, IAT postulates that an utterance containing just one proposition is not yet an argument – it is simply an assertion, where the speaker is stating their opinion. It is only in the context of dialogical challenges, when the speaker is providing a justification for their proposition, that an argument is constructed. An argument then, is a pair of (at least) two propositions: a conclusion (a claim) and a premise justifying it. In Example 1, presented in Section 1 of this paper, the proposition "Polish health service is in a heart-attack threatening

condition" serves as a premise, justifying "we propose the pact for Polish health service…", which then becomes a conclusion. Following IAT, we adopt a descriptive rather than prescriptive approach in argument analysis, refraining from judging the quality of arguments proposed by the speaker. The aim of our annotation is to identify argument structures (i.e., premise-conclusion pairs), based on the context indicating argumentative intention (realized in the speech act of arguing). Whether a given premise really justifies a given conclusion is not assessed in our analysis. This method allows us to separate argumentative fragments of texts from non-argumentative ones, allowing us to identify only those metaphors and emotional appeals that appear within argument structures. Figure 3 presents the premise and conclusion pair in OVA+ software, used to annotate[2] them in text.

2.3 Emotional appeals

To conceptualize emotions within the framework of discourse dynamics, our analysis centers on emotional appeals that speakers use to affect the listener's cognitive state. We understand emotional appeal as speaker's attempt to elicit emotions in hearers, which is akin to the psychological tradition of inducing emotions in experiments. In doing so, we move away from expressing the speakers' own emotions and focus on
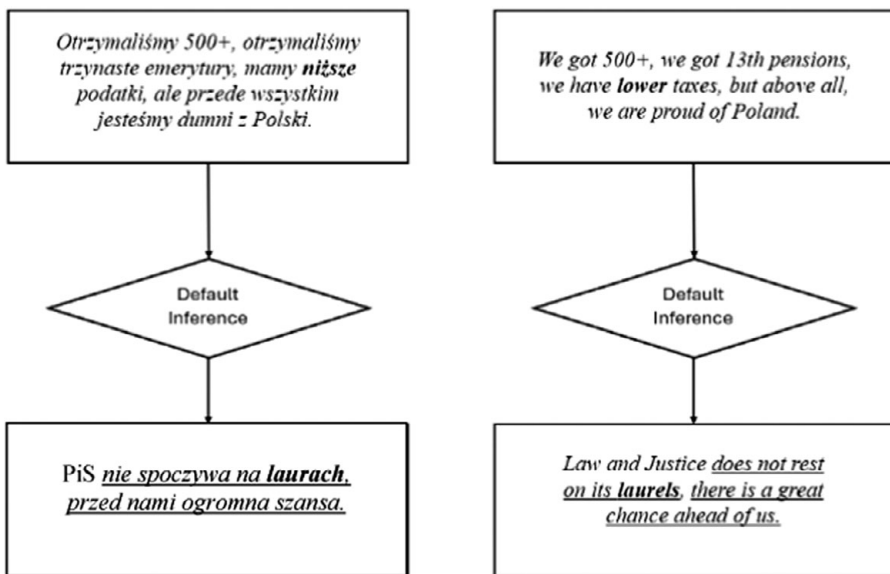

Figure 3. Example of premise and conclusion pair (English translation of Example 2, analyzed in detail in Section 3.3).

---

[2]The annotators were the students from the BA seminar of one of the Authors, and the Cohen's Kappa for inter-annotator agreement was calculated on 10% sample and resulted in above 0.6 agreement. Arguments in TVP corpus can be accessed here (http://corpora.aifdb.org/debateTVP), arguments in TVN corpus: (http://corpora.aifdb.org/debateTVN). To access dialogical view use "Menu" – "Edit with OVA+" or download the corpus or individual files as .json files.

the emotions they induce in the hearers. We conceptualize emotion categories following Plutchik's (Plutchik, 2003) idea of emotions as chains of events – each category of emotions is described by its prototypical stimulus event, cognitive evaluation of the stimulus, the feeling state, manifested behaviour, and effect.

In our paper, we follow Plutchik with Wierzba's (Wierzba et al., 2021) modification and accept the following definitions of five[3] categorial emotions:

- **HAPPINESS**: is evoked by the gain of valued object which can be possessed, retained, and, in effect, leads to gaining resources;
- **FEAR**: is caused by a threatening stimulus, related to a cognitive state of danger and reaction of escaping to safety;
- **ANGER**: is elicited by the presence of an obstacle, enemy, leading to the attack aiming at destroying obstacle;
- **SADNESS**: is caused by a loss of valued object, related to cognitive state of abandonment, and behavioural expressions such as crying, effect is the need of reattachment to the lost object;
- **DISGUST**: stimulated by the presence of unpalatable objects, cognitively recognized as poison, with physical reactions such as vomiting with the effect of ejecting poison.

Emotional responses can be triggered by both the physical and linguistic actions of individuals. Our interest lies in the linguistic aspect, focusing on how words themselves can evoke specific emotions through their symbolic meanings rather than their physical presence. This approach allows us to analyse language in terms of emotionally charged expressions, ranging from aggressive speech, such as verbal harassment, to the use of words that inherently carry emotional weight, leading to particular emotional responses. This conceptual framework is informed by the study of stimulus words, which are identified as those having the capacity to elicit specific emotions. Among these, certain terms, like "podatki" ("taxes"), have been shown to induce negative emotional reactions, such as anger and fear, within specific cultural contexts. This assertion is supported by research within the Polish cultural sphere, utilizing the NAWL (Riegel et al., 2015; Wierzba et al., 2015) lexicon, a tool culturally adapted from the broader tradition of emotional lexicons like English ANEW (Bradley & Lang, 2017) and German BAWL-R (Briesemeister et al., 2011). The findings from these studies, which draw on the emotional evaluations by a vast number of participants across a wide array of words, underscore the significance of verbal cues in provoking distinct emotional states, as documented by researchers in the field of psychology. We have chosen two emotion lexicons, which are based on the list of Polish vocabulary: Nencki Affective Word List (NAWL) (Riegel et al., 2015; Wierzba et al., 2015) and Emotional Meaning (EMEAN) (Wierzba et al., 2021). The first one – NAWL – is a cultural adaptation of the Berlin Affective Word List-Reloaded (BAWL-R) for Polish. The NAWL list consists of 2,902 Polish words with ratings of emotional valence, arousal and imageability. Ratings were collected from

---

[3]We decided to omit the sixth basic emotion in Ekman's theory – surprise, since "it is rather difficult to measure by means of self-report [and it is viewed] not as an emotion, but rather as a pre-emotional cognitive state" (Wierzba et al., 2021). The same set of five emotion categories was used in Nencki's Affective Word List (NAWL) study (Wierzba et al., 2015).

266 Polish participants. Words were translated from the German version and back-translated to check the validity of the list (the detailed procedure is described in the original paper by Riegel et al., 2015). The distribution of the parts of speech in the NAWL list was matched with proportions of Polish language and the frequency of words was controlled using the National Corpus of the Polish Language (Pęzik, 2012). The NAWL list is based on "a dimensional view of emotions, which assumes that emotion can be defined as the coincidence of values on a number of different dimensions" (Riegel et al., 2015, p. 1225), which was first used in Osgood's study on measurement of word meaning (Osgood et al., 1957). All words were rated on three scales: emotional valence, arousal and imageability. The valence scale ranges from -3 to 3, whereas the arousal scale ranges from 1 to 5. The second set of scales was used to assess the same list of words and with the same number of participants. Following basic emotions were tested: happiness, anger, sadness, fear, and disgust (Ekman, 1992; Ortony & Turner, 1990; Panksepp, 1992). These scales were 7-point and participants were asked to assess the intensity of each emotion as their immediate and spontaneous reaction to words presented on computer screen (Riegel et al., 2015). Going back to the word "taxes", mentioned before, the NAWL list describes its mean value of anger at 4.12, fear at 3.27, and happiness only at 1.38. In this way, emotional lexicons provide grounds and cultural context for assessing emotive words.

The EMEAN list is more recent than NAWL, since the database was published in 2021 and broader, since the list is twice longer and it was assessed by 21,878 participants. EMEAN stands for Emotional Meaning, and it consists of 6,000 word meanings which were used to elicit 8 basic emotions: anger, disgust, fear, sadness, anticipation, happiness, surprise and trust. Additionally, participants were asked to rate valence and arousal on scales ranging from -3 to $+3$ and from 0 to $+4$, respectively. Word meanings were chosen from the initial pool of 30,080 items, but only partial results of the study had been disclosed for public, non-commercial use. Eliciting emotional reactions to word meanings allows to solve the problem of polysemy and ambiguity of words. Words differ in meaning depending on their context (De Deyne et al., 2021; Wierzba et al., 2021).

Emotion lexicons are used to study emotional appeals via automatic detection of emotion-eliciting words in texts from social media, political speeches and debates, press, market research or as verbal stimuli used in psycholinguistic or neurolinguistic studies. Emotion lexicons are extensively used in many disciplines, mainly in psychological studies of emotions and their influence on other cognitive processes (Barrett et al., 2007; Lindquist, 2017) or in corpus linguistics, discourse studies and media monitoring, where detection of emotional words in large collections of text is automated and applied to develop computational models of natural language use (Cowen & Keltner, 2021; Dodds et al., 2015). The emotional features of words from EMEAN list merge two theoretical frameworks: dimensional (valence and arousal; Bradley & Lang, 1994; Osgood et al., 1957; Russell & Mehrabian, 1977) and categorical (anger, disgust, fear, sadness, anticipation, happiness, surprise and trust; Ekman, 1992; Ortony & Turner, 1990; Plutchik, 1982).

Studies indicate that emotional arguments are present and hold considerable importance in the realm of argumentation. Carozza (2022) examines into various interpretations of emotional arguments and offers a normative framework for their assessment. Both Benlamine et al. (2017) and Villata et al. (2017) present empirical evidence for the link between emotions and argumentation, demonstrating that emotions can influence the way individuals reason and debate. Carozza (2008) investigates the reluctance to recognize emotional arguments, positing that belief

systems and personality styles are crucial to the emotional aspect of argumentation. Together, these papers emphasize the significance of emotions in argumentation and advocate for their consideration when evaluating arguments.

2.4. Operationalization of hypotheses

In sum, the conceptualization of three dynamic discourse phenomena proposed in this paper allows us to investigate the interaction between them in one analytical frame presented in Table 1.

Based on such conceptualizations we propose the following operationalization of hypotheses presented in Section 1:

H1: Premise-conclusion pairs with metaphorical lexical units (annotated manually) are more frequent in the corpus than premise-conclusion pairs without metaphorical lexical units and without emotion-eliciting words.

H2: Premise-conclusion pairs with emotion-eliciting words are more frequent in the corpus than premise-conclusion pairs without emotion-eliciting words.

H3: Premise-conclusion pairs with metaphorical lexical units and emotion-eliciting words are more frequent than the sum of all other types of combination (premise conclusion-pairs without metaphorical lexical units and without emotion-eliciting words; premise-conclusion pairs with emotion-eliciting words, but without metaphorical lexical units; premise-conclusion pairs with emotion-eliciting words, but without metaphorical lexical units).

3. Methods and materials

3.1. Political debates

Our study is based on the corpora of two Polish 2019 pre-election debates (18,783 words in total), annotated with metaphors using Metaphor Identification Procedure (PRAGGLEJAZ Group, 2007) and arguments using Inference Anchoring Theory (Reed & Budzynska, 2011). The third layer consists of automatic identification of emotion-eliciting words based on EMEAN and NAWL databases (Wierzba et al., 2021). This allows us to capture the elements of the debate where speakers not only use metaphors in their argumentation (Juszczyk et al., 2022), but they are also adding an emotional appeal to increase the persuasive power of their words. The information about the debates is summarised in Table 2.

3.2. Procedure

In our procedure, three layers of analysis are conducted independently, by separate groups of analysts.

Table 1. Conceptualization of metaphors, arguments and emotion-eliciting words as used in this paper

Metaphors	metaphorical lexical units e.g., _breaking_ the law, _rising_ salaries, _rebuild_ trust, _hard_ fight
Arguments	premise + conclusion pair: *Waiting time for doctors got longer [hence] patients are dying in queues*
Emotional appeals	emotion eliciting words e.g., *taxes, war, family, peace*

Table 2. Description of the TVP and TVN corpus of 2019 pre-election debates

	TVP	TVN	Total
ownership	public	private	
date of broadcast	01/10/2019	08/10/2019	
number of participants	1 host	2 hosts	
	5 politicians	5 politicians	
total running time	01:22:00	00:46:24	02:08:24
total number of words	6766	12017	18783

First, the recording of both debates is transcribed manually.

Second, metaphors are manually annotated. They are identified in transcripts as metaphorical lexical units using Metaphor Identification Procedure (PRAGGLEJAZ Group, 2007) and eMargin software (Kehoe & Gee, 2013). Metaphorical expressions were annotated in accordance with (Juszczyk & Kamasa, 2016), which adapted the Metaphor Identification Procedure (MIP) (PRAGGLEJAZ, 2007). In order to facilitate online group discussions about metaphorical units the team of annotators[4] used the *e-Margin: A Collaborative Textual Annotation Tool* (Kehoe & Gee, 2013), and the resulting data is publicly available.[5] After reading the text excerpt (step 1 in MIP) and identification of lexical units (step 2 in MIP), raters established contextual meaning of each unit (step 3a in MIP) and determined if it has a more basic contemporary meaning in other contexts (step 3b in MIP). The lexical unit was marked as metaphorical if its contextual meaning contrasted with the basic meaning but could be understood in comparison with it (steps 3c and 4 in MIP). Contextual meanings were identified using *Wielki Słownik Języka Polskiego* (*Great Dictionary of the Polish Language*) (Żmigrodzki, 2019). There are 814 metaphors identified in the entirety of the transcripts and 313 metaphors in our corpus of arguments.

Third, argument structures are manually annotated. The debate transcript is segmented into Argumentative Discourse Units (ADUs). In this way, we identify premise–conclusion pairs. In our corpus, there are $N = 615$ such pairs. Argumentative Discourse Units are marked using Online Visualization of Arguments (OVA+) tool (Janier et al., 2014), which allows for the diagramming of the structures described in Inference Anchoring Theory and storing the resulting annotations in the form of Argument Interchange Format – AIF ontology (Chesnevar et al., 2006) as part of AIFdb publicly available database.

Fourth, emotion-eliciting words are automatically extracted using lexical lists: EMEAN (Wierzba et al., 2021) and NAWL (Riegel et al., 2015; Wierzba et al., 2015). Intersection of NAWL and EMEAN gave us a list of 7674 unique items. In doing so, we follow the psychological tradition in researching emotional appeal. We do not use wordlists produced for CLARIN or WordNet.

Fifth, text in MLU and ADUs is lemmatized and sixth, overlap between metaphors, arguments, and emotional appeals is identified using Excel formulas. Our analytic procedure can be summarized in steps shown on Figure 4:

---

[4]The annotators were undergraduate students who performed annotation in exchange for credits. The annotation process was supervised by one of the Authors and the Cohen's Kappa for inter-annotator agreement was calculated on 10% sample and resulted in 0.76 agreement.

[5]Annotations from both Polish debates are available as .csv tables with tags for metaphorical lexical units. Data can be downloaded from http://hdl.handle.net/11321/833.
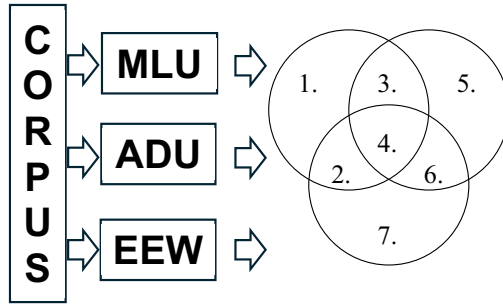
Figure 4. The procedure of data analysis. MLU: Metaphorical Lexical Units; ADU: Argumentative Discourse Units, EEW: Emotion Eliciting Words. Numbers refer to sets of discourse phenomena and their combinations presented in Figure 1.

3.3. Data overview (types and tokens)

Table 3 shows descriptive statistics of types and tokens of lemmatized pairs of premises and conclusions. This data was obtained using AntConc (Anthony, 2022) and Excel formulas.

As we can see on the chart in Figure 5, HAPPINESS is the emotion most intensely appealed to, followed by FEAR, ANGER and SADNESS, which have equal intensity, while DISGUST is the least intense emotion in our study.

Example (2) (presented below and in Figure 3) presents three layers of annotation integrated into one data set. It is a premise and conclusion pair with **emotion-eliciting words** and metaphorical lexical unit:

Table 3. Type-token analysis of the data

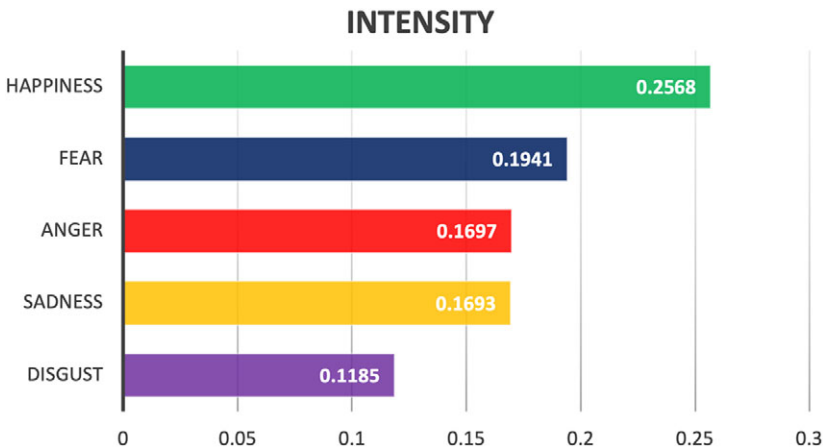|	Tokens	Types
No of lemmatized words of PREMISES and CONCLUSIONS	17572	2515
No of lemmatized words in the PREMISES	9410	2192
No of lemmatized words in the CONCLUSIONS	8162	1479

Figure 5. Average intensity of five basic emotion-eliciting words in premise-conclusion pairs.

(2)   PRZESŁANKA: *Otrzymaliśmy 500+, otrzymaliśmy trzynaste emerytury, mamy* **niższe** *podatki, ale przede wszystkim jesteśmy dumni z Polski.*
KONKLUZJA: *PiS* <u>*nie spoczywa na* **laurach**</u>, <u>*przed nami ogromna szansa.*</u>
PREMISE: *We got 500+, we got 13th pensions, we have* <u>lower</u> **taxes**, *but above all, we are proud of Poland.*
CONCLUSION: *Law and Justice* <u>*does not rest on its* **laurels**</u>, <u>*there is a great* **chance** *ahead of us.*</u>

4. Results

What are the types of interaction between metaphors, arguments and emotion-eliciting words? Table 4 shows proportions of types of interaction in our data in the order of hypothesis presented in Section 1.

Table 4. Types of interaction and their proportions

	Types of interaction	N	%
1.	Arguments alone without metaphors or emotional appeals	97	16%
2.	H1: Argument + metaphor without emotional appeals	17	3%
3.	H2: Argument + emotional appeals without metaphors	304	49%
4.	H3: Argument + metaphor + emotional appeals	197	32%
	Total	615	100

H1 tests whether ADUs are used more often with metaphorical lexical units or without them. Sums of rows 2 and 4 compared to 1 and 3 suggest that we need to reject H1, since the number of ADUs with metaphorical lexical units is smaller than without them (35% vs 65%). As we can see in Table 4, ADUs in combination with metaphorical lexical units and without emotion-eliciting words constitute 3% of our data, arguments in combination with emotion-eliciting words and without metaphorical lexical units constitute 49%, and arguments in combination with both metaphorical lexical units and emotion-eliciting words 32%. This means that ADUs contain over 2x as many emotion-eliciting words (sum of rows 3 and 4 is 81%) as metaphorical lexical units (sum of rows 2 and 4 is 35%), whereas metaphorical lexical units in combination with emotion-eliciting words appear roughly 16 times as often as on their own (row 3 > row 2). The most frequent ADUs with emotion-eliciting-words (sum of rows 3 and 4 is 81%) followed by ADUs with metaphorical lexical units (sum of rows 2 and 4 is 35%) and finally ADUs without metaphorical lexical units and without emotion-eliciting-words (row 1 is 16%). Therefore, as far as H2 is concerned, the number of ADUs with emotion-eliciting words (sum of rows 3 and 4) is bigger than the number of ADUs without emotion-eliciting words (sum of rows 1 and 2) (81% vs 19%), so H2 is verified. H3 is falsified, because the number of ADUs with metaphorical lexical units and emotion-eliciting words is smaller than the sum of other combinations (32% vs 68%).

Analyses presented above allowed us to identify a specific sub-set of our corpus, in which all three phenomena of our interest appear together: the 197 cases of arguments (32%) in which both metaphors and emotion-eliciting words appear. There are two types of the interplay between metaphors and emotional appeals within an argument:

1) metaphorical lexical units and emotion-eliciting words overlap;
2) metaphorical lexical units and emotion-eliciting words are expressed with different lexemes.

In type (1), within a given premise-conclusion pair, there is a partial overlap between metaphorical lexical units and emotion-eliciting words (N = 46), as illustrated by example (3), where metaphorical lexical units are underlined and emotion-eliciting words are marked in **bold**:

(3) **P:** *PiS <u>nie spoczywa na</u> **laurach**, <u>przed nami ogromna</u> **szansa**.*
   K: *Dlatego 13 października głosujemy na Prawo i Sprawiedliwość.*
   [**P:** Law and Justice <u>does not rest on its</u> **laurels**, <u>there is a great</u> **opportunity** <u>ahead of us;</u>
   C: Therefore, we vote for Law and Justice on October, 13]

In example (3) there are two metaphorical expressions: "nie spoczywa na **laurach**" ("does not rest on its **laurels**" and "przed nami ogromna szansa" ("a great **opportunity** ahead of us") each of which contains an emotion-eliciting word – "laury" ("laurels") and "szansa" ("opportunity") – which provoke positive emotions in the recipients.

Type (2) of interaction takes place when, within a given premise or conclusion, metaphorical lexical units and emotion-eliciting words are expressed through different lexemes ($N = 151$), that is, there is no overlap between metaphors and emotion-eliciting word, however, they co-occur in the same argument (that is the same ADU), like in example (4):

(4) **P:** *Lewica pomyśli też jak <u>zapobiegać</u> suszy, która <u>pustoszy</u> nasz kraj*
   K: *Lewica ma na to* **receptę**.
   [**P:** The Left thinks how to <u>prevents</u> the draught, which <u>ravages</u> our country
   C: The Left has the **recipe** for that]

In example (4), the word "zapobiegać" ("prevent") elicits HAPPINESS, when "pustoszy" ("ravages") is used metaphorically.

5. Conclusion

The aim of this paper was to analyse the interaction of three discourse phenomena: metaphors, arguments, and emotional appeals. To achieve this goal, we performed the comparison of three layers of annotation in natural language corpora of pre-election debates in Poland. As all three of the phenomena can be used for persuasive gain, we postulated that arguments containing metaphors would be more frequent in our data than arguments without metaphors (H1). This proved not to be the case: arguments containing metaphors constitute 35% of all arguments (214 of 615 premise-conclusion pairs). Our second hypothesis (H2) posited that arguments with emotional appeals will be more frequent than arguments without them. This hypothesis has been verified, as 81% of all arguments contained emotion-eliciting words (501 out of 615). Our third hypothesis (H3) that arguments with metaphors and with emotional appeals will be the most frequent of all the investigated types has not been verified. It ranks second in frequency (32%, 197 arguments out of 615) after arguments with emotional appeals. This means that in our data the predominant form of argumentation is relying on emotional appeals.

What is most interesting, however, is that of all identified uses of metaphors in arguments, a majority (197 cases of 214) also contained emotional appeals, thus indicating that metaphors alone have a much smaller frequency of use in political argumentation. Our results show that when the speakers are introducing metaphors in their arguments, they also tend to use emotion-eliciting words. The presence of arguments with metaphors but without emotion-eliciting words is minimal in our data. This might suggest that when the speakers use metaphors in arguments to conceptualise abstract concepts, they also select a specific frame by their choice of specific source domain. Due to the inherently persuasive nature of the pre-election debates, when faced with the need for metaphorization, the speakers are not selecting emotionally neutral domains, but instead, are framing the abstract concepts in emotion-eliciting wording, to increase the persuasive power of arguments (on axiological marking of concepts and metaphors see Krzeszowski, 1997). Hence, "Polska służba zdrowia jest **w stanie przedzawałowym**" ("Polish health service is **in a heart threatening condition**") is not only a metaphor – it is an emotional metaphor, where specific source domain is chosen by the speaker as a persuasive strategy. This is in accordance with the previous studies pointing to the fact that the selection of specific source domain can influence the choice of further action (Thibodeau & Boroditsky, 2011).

One limitation of our study is the lack of sensitivity to the contexts in which emotional words are used. Lexicons provide broad and general information about emotions evoked by a given word, but its use in a certain context can heavily influence this effect. This is the factor that has not been taken into account in our study and could possibly be included in future work using more advanced computational methods. A limitation related to this lies also in the construction of lexicons. Some words that probably could elicit emotions are not present in lexicons, and therefore are not included in our analysis, leading to its incompleteness. The dynamic discourse phenomena analysed here depend on the dialogical co-text and context, including previous turns, relation between speakers and the audience and so forth. While we tried to contextualise those in our interpretation of examples, the actual analysis of persuasive effects of the use of metaphors, emotional appeals, and arguments remains in the realm of psycholinguistic experiments.

What our study contributes to this line of research is emphasis on emotive element of selected metaphorical framings. Speakers can, and often do, select specific frames in order to provoke a positive or negative effect towards given phenomena or/and to elicit specific emotions in hearers. In this paper, we presented how using tools from computational linguistics, argument analysis, and psychological lexicons can uncover these persuasive strategies.

1. Recordings of debates were transcribed manually; see files '1.TVP-DEBATE-TRANSCRIPT.docx' and '1.TVN-DEBATE-TRANSCRIPT.docx'.
2. Metaphors (manual annotation): MIP, 814 metaphorical lexical units; see files '2.TVP-DEBATE-META-PHORS.csv' and '2.TVN-DEBATE-METAPHORS.csv'.

3. Argumentative Discourse Units: 615 pairs of premise and conclusion (manual annotation); see files '3. PAIRS of premises and conclusions from TVP debate.json' and '3.PAIRS of premises and conclusions from TVN debate.json'.
4. Emotion-eliciting words (automatic extraction) from EMEAN and NAWL databases; see file '4. Emotion-eliciting words.xlsx'.
5. Since words listed in EMEAN and NAWL are lemmas, in order to extract emotion-eliciting words, text from Argumentative Discourse Units was lemmatized as well; see file '5.LEMMSofPRE&CON. xlsx'.
6. The three layers are integrated into one dataset and overlap between arguments and metaphorical lexical units (6.a.), arguments and emotion-eliciting words (6.b.), and emotion-eliciting words and metaphorical lexical units in arguments (6.c.) are identified; see file '6.ADUwithMLUandEMO.xlsx'.

References

Anthony, L. (2022). *AntConc (Version 4.2.0) [Computer Software].* (4.2.0.). Waseda University. https://www.laurenceanthony.net/software

Asma, S. T. (1995). Metaphors of race: Theoretical presuppositions behind racism. *American Philosophical Quarterly*, 32(1), 13–29. https://www.jstor.org/stable/20009802

Barrett, L. F., Lindquist, K. A., & Gendron, M. (2007). Language as context for the perception of emotion. *Trends in Cognitive Sciences*, 11(8), 327–332. https://doi.org/10.1016/j.tics.2007.06.003

Benlamine, M. S., Villata, S., Ghali, R., Frasson, C., Gandon, F., & Cabrio, E. (2017). Persuasive argumentation and emotions: An empirical evaluation with users. In *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* (Vol. 10271, pp. 659–671). Springer. https://doi.org/10.1007/978-3-319-58071-5_50

Bradley, M. M., & Lang, P. J. (2017). *Affective norms for English words (ANEW): Instruction manual and affective ratings*. Technical Report C-3. University of Florida.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, 25(1), 49–59. https://doi.org/10.1016/0005-7916(94)90063-9

Briesemeister, B. B., Kuchinke, L., & Jacobs, A. M. (2011). Discrete emotion norms for nouns: Berlin affective word list (DENN–BAWL). *Behavior Research Methods*, 43(2), 441–448. https://doi.org/10.3758/s13428-011-0059-y

Brugman, B. C., Burgers, C., & Vis, B. (2019). Metaphorical framing in political discourse through words vs concepts: A meta-analysis. In *Language and Cognition* (Vol. 11, Issue 1, pp. 41–65). Cambridge University Press. https://doi.org/10.1017/langcog.2019.5

Cameron, L. (2010). 5: The discourse dynamics framework for metaphor. In L. Cameron & R. Maslen (Eds.), *Metaphor analysis - research practice in applied linguistics, social sciences and the humanities*. (pp. 77–94). Equinox eBooks Publishing.

Cameron, L. (2012). *Metaphor and reconciliation*. Routledge. https://doi.org/10.4324/9780203837771

Cameron, L., & Maslen, R. (2010). *Metaphor analysis: Research practice in applied linguistics, social sciences and the humanities*. Equinox.

Carozza, L. (2008). Dissent in the midst of emotional territory. *Informal Logic*, 27(2), 197. https://doi.org/10.22329/il.v27i2.475

Carozza, L. (2022). Amenable argumentation approach. *Informal Logic*, 42(3), 563–582. https://doi.org/10.22329/il.v42i3.7500

Charteris-Black, J. (2004). Critical metaphor analysis. In J. Charteris-Black (Ed.), *Corpus approaches to critical metaphor analysis* (pp. 243–253). Palgrave Macmillan UK. https://doi.org/10.1057/9780230000612_12

Charteris-Black, J. (2019). *Metaphors of brexit: No cherries on the cake?* Springer International Publishing. https://doi.org/10.1007/978-3-030-28768-9

Chesnevar, C., McGinnis, J., Modgil, S., Rahwan, I., Reed, C., & Simari, G. (2006). Towards an argument interchange format. *Knowledge Engineering Review*, 293–316.

Cowen, A. S., & Keltner, D. (2021). Semantic space theory: A computational approach to emotion. *Trends in Cognitive Sciences*, 25(2), 124–136. https://doi.org/10.1016/j.tics.2020.11.004

Damasio, A. (2003). *The feeling of what happens descartes' error*. www.randomhouse.co.uk

D'Angelo, P., & Lombard, M. (2008). The power of the press: The effects of press frames in political campaign news on media perceptions. *Atlantic Journal of Communication*, 16(1), 1–32. https://doi.org/10.1080/15456870701647391

De Deyne, S., Navarro, D. J., Collell, G., & Perfors, A. (2021). Visual and affective multimodal models of word meaning in language and mind. *Cognitive Science*, 45(1). https://doi.org/10.1111/cogs.12922

Deignan, A., Semino, E., & Paul, S.-A. (2019). Metaphors of climate science in three genres: Research articles, educational texts, and secondary school student talk. *Applied Linguistics*, 40(2), 379–403. https://doi.org/10.1093/applin/amx035

Dijk, T. A. van. (1997). What is political discourse analysis? *Belgian Journal of Linguistics*, 11(1), 11–52. https://doi.org/10.1075/bjl.11.03dij

Dodds, P. S., Clark, E. M., Desu, S., Frank, M. R., Reagan, A. J., Williams, J. R., Mitchell, L., Harris, K. D., Kloumann, I. M., Bagrow, J. P., Megerdoomian, K., McMahon, M. T., Tivnan, B. F., & Danforth, C. M. (2015). Human language reveals a universal positivity bias. *Proceedings of the National Academy of Sciences*, 112(8), 2389–2394. https://doi.org/10.1073/pnas.1411678112

Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion*, 6(3–4), 169–200. https://doi.org/10.1080/02699939208411068

Ervas, F., Rossi, M. G., Ojha, A., & Indurkhya, B. (2021). The double framing effect of emotive metaphors in argumentation. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.628460

Hajiali, M. (2020). Big data and sentiment analysis: A comprehensive and systematic literature review. *Concurrency and Computation: Practice and Experience*, 32(14), e5671. https://doi.org/10.1002/CPE.5671

Hart, C. J. (2018). "Riots engulfed the city": An experimental study investigating the legitimating effects of fire metaphors in discourses of disorder. *Discourse and Society*, 29(3), 279–298. https://doi.org/10.1177/0957926517734663

Isaza, C., & Ossewaarde, R. (2021). Corruption in public discourses: A comparison between colombian and european metaphors. *Public Integrity*, 23(4), 401–425. https://doi.org/10.1080/10999922.2021.1881299

Janier, M., Lawrence, J., & Reed, C. (2014). OVA+: An argument analysis interface. In *Proceedings of the 5th International Conference on Computational Models of Argument (COMMA'14)*, 463–464.

Juszczyk, K. M., & Kamasa, V. (2016). Ku metodzie identyfikacji wyrażeń metaforycznych dla polszczyzny na przykładzie rozmów o karierze zawodowej. In A. Knapik, M. Odelski, P. Chruszczewski, & W. Chłopicki (eds.), *Niedosłowność w języku* (pp. 177–186). Tertium.

Juszczyk, K. M., Konat, B., & Fabiszak, M. (2022). Speakers who metaphorize together–argue together. Interaction between metaphors and arguments as a dynamic discourse phenomenon. *Metaphor and the Social World*, 12, 245–269. https://doi.org/10.1075/msw.21016.jus

Kehoe, A., & Gee, M. (2013). eMargin: A collaborative textual annotation tool. *ICAME 33 Corpora at the Centre and Crossroads of English Linguistics*, 263–265.

Krzeszowski, T. (1997). *Angels and devils in hell: Elements of axiology in semantics*. Energeia.

Lakoff, G. (1993). The contemporary theory of metaphor. In *Metaphor and Thought* (pp. 202–251). Cambridge University Press. https://doi.org/10.1017/CBO9781139173865.013

Lakoff, G. (2016). *Moral politics: How liberals and conservatives think*, Third Edition. University of Chicago Press.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind & its challenge to western thought*. Basic Books.

Lakoff, G., & Johnson, M. (2003). *Metaphors we live by*. University of Chicago Press.

Landau, M. J., Robinson, M. D., & Meier, B. P. (2014). *The power of metaphor: Examining its influence on social life*. American Psychological Association.

Lewandowska-Tomaszczyk, B. (2019). Sources of data and methodological foundations of a contrastive linguistic analysis of emotion concepts. *Biuletyn Polskiego Towarzystwa Językoznawczego*, 74. https://doi.org/10.17651/bptj.74.12

Lindquist, K. A. (2017). The role of language in emotion: existing evidence and future directions. *Current Opinion in Psychology*, 17, 135–139. https://doi.org/10.1016/j.copsyc.2017.07.006

Louw, B., & Milojkovic, M. (2015). Shared logical form or shared metaphysics? In search of corpus-derived empathy in stylistics. *Procedia - Social and Behavioral Sciences*, 198, 535–545. https://doi.org/10.1016/j.sbspro.2015.07.476

Musolff, A. (2012). The study of metaphor as part of critical discourse analysis. *Critical Discourse Studies*, 9 (3), 301–310. https://doi.org/10.1080/17405904.2012.688300

Musolff, A. (2021). Hyperbole and emotionalisation: Escalation of pragmatic effects of proverb and metaphor in the "Brexit" debate. *Russian Journal of Linguistics*, 25(3), 628–644. https://doi.org/10.22363/2687-0088-2021-25-3-628-644

Negro Alousque, I. (2020). The metaphorical representation of brexit in digital political cartoons. *Visual Communication Quarterly*, 27(1), 3–12. https://doi.org/10.1080/15551393.2019.1707084

Neshkovska, S., & Trajkova, Z. (2020). Coronavirus–inspired metaphors in political discourse. *Thesis*, 9(2), 99–132. https://hrcak.srce.hr/250879

Nytspol, V. I., & Kobuta, S. S. (2022). Conceptual metaphor of Russian-Ukrainian war in American media discourse. *International Humanitarian University Herald. Philology*, 56, 111–114. https://doi.org/10.32841/2409-1154.2022.56.24

Ogarkova, A. A., & Salinas, C. S. (2014). *Emotion and the body: A corpus-based investigation of metaphorical containers of anger across languages.* https://api.semanticscholar.org/CorpusID:151837100

Ogarkova, A., & Soriano, C. (2014). Emotion and the body: A corpus-based investigation of metaphorical containers of anger across languages. *International Journal of Cognitive Linguistics*, 5, 147–179.

Ortony, A., & Turner, T. J. (1990). What's basic about basic emotions? *Psychological Review*, 97(3), 315–331. https://doi.org/10.1037/0033-295X.97.3.315

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). *The measurement of meaning.* University of Illinois Press.

Panksepp, J. (1992). A critical role for "affective neuroscience" in resolving what is basic about basic emotions. *Psychological Review*, 99, 554–560. https://doi.org/10.1037/0033-295X.99.3.554

Perrez, J., & Reuchamps, M. (2015). The "Belgian Tetris": Assessing the political impact of metaphors on citizens' representations of Belgian federalism. *Metaphor and the Social World*, 5(2), 223–244. https://doi.org/10.1075/msw.5.2.03per

Pęzik, P. (2012). *Wyszukiwarka PELCRA dla danych NKJP.* (A. Przepiórkowski, M. Bańko, R. Górski, & B. Lewandowska-Tomaszczyk, Eds.). Wydawnictwo PWN.

Piccirilli, P., & Schulte im Walde, S. (2022). *Features of perceived metaphoricity on the discourse level: Abstractness and emotionality.* https://doi.org/10.48550/ARXIV.2205.08939

Plutchik, R. (1982). A psychoevolutionary theory of emotions. *Social Science Information*, 21(4–5), 529–553. https://doi.org/10.1177/053901882021004003

Plutchik, R. (2003). *Emotions and life: Perspectives from psychology, biology, and evolution.* American Psychological Association.

Porto, M. D. (2022). Water metaphors and evaluation of syrian migration: The flow of refugees in the Spanish Press. *Metaphor and Symbol*, 37(3), 252–267. https://doi.org/10.1080/10926488.2021.1973871

Pragglejaz Group. (2007). MIP: A method for identifying metaphorically used words in discourse. *Metaphor and Symbol*, 22(1), 1–39. https://doi.org/10.1080/10926480709336752

Reali, F., & Arciniegas, C. (2014). Metaphorical framing influences how we think about emotions. *Cognitive Science*, 36. https://api.semanticscholar.org/CorpusID:12942154

Reed, C., & Budzynska, K. (2011). How dialogues create arguments. In *Proceedings of the 7th Conference of the International Society for the Study of Argumentation (ISSA)*, 1633–1645.

Riegel, M., Wierzba, M., Wypych, M., Żurawski, Ł., Jednoróg, K., Grabowska, A., & Marchewka, A. (2015). Nencki Affective Word List (NAWL): The cultural adaptation of the Berlin Affective Word List–Reloaded (BAWL-R) for Polish. *Behavior Research Methods*, 47(4), 1222–1236. https://doi.org/10.3758/S13428-014-0552-1

Russell, J. A., & Mehrabian, A. (1977). Evidence for a three-factor theory of emotions. *Journal of Research in Personality*, 11(3), 273–294. https://doi.org/10.1016/0092-6566(77)90037-X

Theodoropoulou, M. (2012). Metaphor-metonymies of joy and happiness in Greek. *Review of Cognitive Linguistics*, 10(1), 156–183. https://doi.org/10.1075/rcl.10.1.05the

Thibodeau, P. H., & Boroditsky, L. (2011). Metaphors we think with: The role of metaphor in reasoning. *PLoS ONE*, 6(2), e16782. https://doi.org/10.1371/journal.pone.0016782

Villata, S., Cabrio, E., Jraidi, I., Benlamine, S., Chaouachi, M., Frasson, C., & Gandon, F. (2017). Emotions and personality traits in argumentation: An empirical evaluation 1. *Argument and Computation*, 8(1), 61–87. https://doi.org/10.3233/AAC-170015

Walton, D. (2000). *Scare tactics* (Vol. 3). Springer Netherlands. https://doi.org/10.1007/978-94-017-2940-6

Wierzba, M., Riegel, M., Kocoń, J., Miłkowski, P., Janz, A., Klessa, K., Konat, B., Grimling, D., Piasecki, M., & Marchewka, A. (2021). Emotion norms for 6000 Polish word meanings with a direct mapping to the Polish wordnet. *Behavior Research Methods*, 54(5), 2146–2161. https://doi.org/10.3758/s13428-021-01697-0

Wierzba, M., Riegel, M., Wypych, M., Jednorwóg, K., Turnau, P., Grabowska, A., & Marchewka, A. (2015). Basic emotions in the Nencki Affective Word List (NAWL be): New method of classifying emotional stimuli. *PLoS ONE*, 10(7). https://doi.org/10.1371/journal.pone.0132305

Żmigrodzki, P. (2019). Wielki słownik języka polskiego PAN: geneza, koncepcja, zasady opracowania. In *Wielki słownik języka polskiego PAN: geneza, koncepcja, zasady opracowania*. https://doi.org/10.17651/wsjp2018